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ABSTRACT

The Charlton pilot project was one of a number of trials undertaken throughout Australia to bring educational resources to isolated children. In this project, Telecom Australia provided seven small Victorian Higher School Certificate (H.S.C.) schools with two first prototype experimental devices: firstly, a small group terminal and secondly, access to an automatic teleconferencing bridge. The terminals enabled the schools to communicate in a group-to-one situation or a group-to-group situation. The automatic bridge enabled the schools to interact together in a multi-group situation. Seventeen teachers used the 2 devices with 36 high school students to teach Australian history, art, English literature, and politics. Data for evaluation were collected from logbooks; teacher and student questionnaires completed after a sample of sessions; two interviews of principals, teachers, and students; a form of participant listening; and Telecom Australia. The system was used 27 times with the bridge and 95 times without the bridge. The major contribution was to give schools access to a range of external expertise such as H.S.C. examiners, present and past politicians, and authorities on Aboriginal affairs. Of a secondary consequence was the flow of printed information to the schools and an exchange of information between the teachers using the teleconference system. (Author/AH)

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TELECONFERENCING IN EDUCATION

Evaluation of the Charlton Pilot Project

(or, how the teachers blew up the Charlton bridge)

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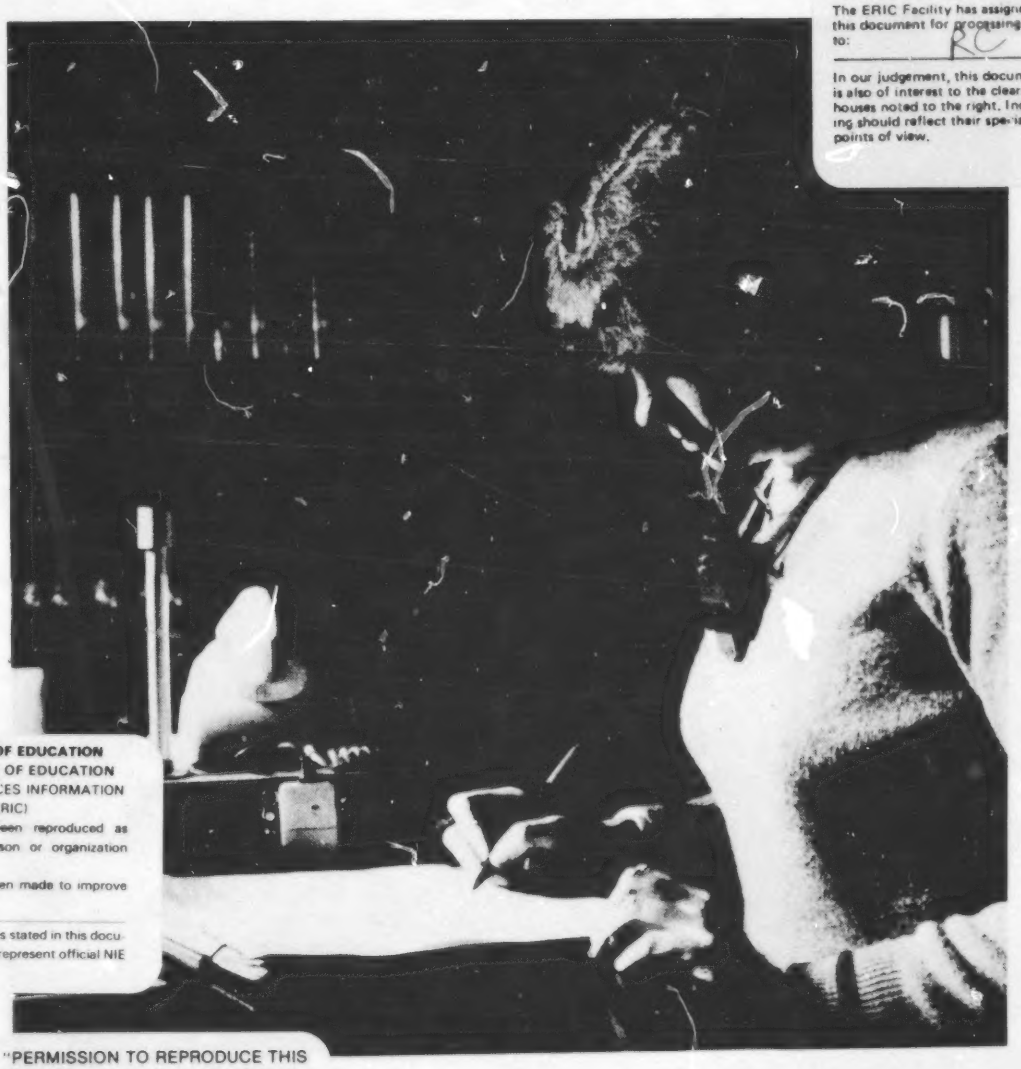

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Report Prepared for the Victorian Country Education Project

October 1932

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Table of Contents

		Page
Chapter 1.	Introduction.	
	1.1 Preamble.	1
	1.2 The Country Education Project.	1
	1.3 The Charlton Pilot Project.	2
Chapter 2.	Evaluation Methodology.	
	2.1 Introduction.	10
	2.2 Educational Setting for the Pilot Project.	10
	2.3 Procedures for Gathering Data.	18
	2.4 Limitations to the Evaluation.	21
Chapter 3.	Literature Review.	24
Chapter 4.	Frequency of the Use of the System.	
	4.1 Multiple School Use by More Than Two Schools Using the Teleconference Automatic Bridge.	26
	4.2 Single or Dual School Use without the Teleconference Bridge.	27
	4.3 Duration of the Use of the Teleconference System.	32
Chapter 5.	Success of the Anticipated Goals.	
	5.1 Increase in the Degree of Interaction.	34
	5.2 Success of the Technology in Saving Time.	42
Chapter 6.	Attitudes About Teleconferencing and Acceptance of the System.	
	6.1 Principals' Attitudes.	44
	6.2 Teachers' Attitudes.	44
	6.3 Students' Attitudes.	49
Chapter 7.	Some Educational Implications of the System.	
	7.1 The Impact of the System on the Level of Student Achievement.	53
	7.2 Impact of the Technology on the Classroom Management of Instruction.	58
	7.3 Impact of the Technology on Curriculum Development.	61
	7.4 Impact of the technology on teaching style.	61
	7.5 Impact of the Technology on External Participants.	62

Chapter 8. Technical Aspects of the Teleconference System.
8.1 The Remote Terminal. 64
8.2 The Teleconference Bridge. 65
8.3 Telecom's Technical Support Services. 67
8.4 Location of the Remote Terminal Within the Schools. 67

Chapter 9 Economic Aspects of the Teleconference System
9.1 Approximate Establishment Costs if the Equipment is Hired. 69
9.2 Approximate Establishment Costs if the Equipment is Purchased. 70
9.3 Annual Recurrent Cost if the Equipment is Hired. 71
9.4 Annual Recurrent Cost if the Equipment is Purchased. 72
9.5 Offsetting Costs. 72
9.6 Cost of Telephone calls. 72
9.7 Willingness of the schools to Pay for the System. 73
9.8 Conclusion. 73

Chapter 10. Conclusions and Recommendations.
10.1 Conclusions. 73
10.2 Advantages and disadvantages. 78
10.3 Recommendations. 79

References. 84

Appendices.
Appendix A List of Participants. 87
Appendix B Page of the Charlton Pilot Project Logbook. 88
Appendix C Teacher Questionnaire. 89
Appendix D Student Questionnaire. 92
Appendix E Summary of Interview Questions. 95
Appendix F Letter from Bob Lewis. 98
Appendix G Letters from D. Anthonyand A. Missen. 100

Front Cover: The photo on the front cover shows Christine Walen of St Arnaud High School using the small group terminal.

Back Cover: The photo on the back cover shows Brendan Monks using the small group terminal with his Boort High School Australian History class.

(Photos-Courtesy, Telecom Australia)

List of Tables

		Page
Table 1.	Demographic Characteristics of Schools.	12
Table 2.	School Expenditure on Postage and Telephones.	14
Table 3.	Interschool Visits within the Region.	16
Table 4.	Teleconferencing System Use by Type of Use.	29
Table 5.	Teleconferencing System Use by Schools	31
Table 6.	Teacher's Attitudes Towards the Teleconferencing System.	45
Table 7.	Teacher Feelings Towards the Discussions	48
Table 8.	Student Attitudes Towards the Teleconferencing System.	50
Table 9.	Student Feelings Towards the Discussions.	52
Table 10.	Student Assessment of the Impact of the Teleconferencing System on Their Understanding of Topics.	54
Table 11.	Student Assessment of the Effectiveness of Teleconferencing Relative to Other Forms of Learning.	55
Table 12.	Approximate Establishment Costs if the Equipment is Hired.	69
Table 13.	Approximate Establishment Costs if the Equipment is Purchased	70
Table 14.	Recurrent Cost of the Teleconferencing System if the Equipment is Hired	71
Table 15.	Recurrent Costs of the Teleconferencing System if the Equipment is Purchased	72

List of Figures

		Page
Figure 1.	The Small Group Terminal	5
Figure 2.	The Australian History Class at St Arnaud High School using the System.	7
Figure 3.	A close-up of the terminal and headsets being used by Brendan Monks and two of his Australian History students at Boort High School.	7
Figure 4.	Diagram of the Uses of the Teleconferencing System.	8
Figure 5.	Location of the Group of Schools in Victoria.	17

SUMMARY

The Charlton pilot project was one of a number of trials which have been undertaken throughout Australia to bring educational resources to isolated children. In this pilot project, Telecom Australia provided seven small Victorian secondary schools with two first prototype experimental devices. Firstly, a small group terminal and secondly, access to an automatic teleconferencing bridge. The terminals enabled the schools to communicate in a group-to-one situation or a group-to-group situation. The automatic bridge enabled the schools to interact together in a multi group situation. Seventeen teachers used the two devices with thirty-six H.S.C. students to teach Australian History, Art, English Literature and Politics.

Data for the evaluation was collected from logbooks, teacher and student questionnaires completed after a sample of sessions, two interviews of principals, teachers and students, a form of participant listening and from Telecom Australia.

The system was used twenty-seven times with the bridge and ninety-five times without the bridge. Its major contribution was to give the schools access to a range of external expertise such as H.S.C. examiners, present and past politicians and authorities on Aboriginal affairs. There was a secondary consequence of a flow of printed information to the schools and an exchange of information between the teachers using the teleconference system. In this way, it made a contribution towards the informal inservice education of the teachers. While no formal indicators were used to test the change in student levels of knowledge, both the teachers and students felt that the interaction which resulted from using the small group terminals and the bridge had made a positive contribution to student understanding of the subject matter which was discussed. The establishment costs of approximately $63,000 and annual recurrent costs of approximately $16,000 plus telephone calls and the unlikelihood of any offsetting costs suggests that districts have to form users groups of potential public and private users to spread the cost.

ACKNOWLEDGEMENTS

The Principals, teachers and students of the seven schools who have participated in the pilot project have spent a considerable amount of time in planning for and using the teleconferencing system and providing the data for evaluation. In particular, Brendan Monks suggested interviewing the examiners who were contacted with the teleconferencing system and Mark Kelly provided a detailed analysis of the technical aspects of the remote terminal. Secondly, Lesley Albertson and Loris Perry of the Telecom Research Laboratories provided data from Telecom's initial survey of participants' attitudes and photographs of the teleconferencing system. Terry O'Driscoll, Telecom Education Account Manager provided details of equipment costs. John Craick, Telecom Senior Engineer provided details of the equipment used and valuable insights into teleconferencing. Dr. Peter White of Latrobe University's Centre for Educational Communication and Media Studies suggested that the evaluation should include some indication of the schools' willingness to pay for the teleconferencing system. Finally, Jack Hicks of the Victorian Education Department's Educational Technology Unit provided valuable assistance in the preparation of tables and presentation of the report and Rosalie Tuohy of A.V.R.B. edited the final draft..

Chapter 1. Introduction

1.1 Preamble.

In the last few years, the telephone has severed its umbilical cord and moved from the passage wall to the poolside, the patio and the automobile. Accompanying its transformation in appearance and location is an extension of its traditional functions into areas previously untried in Australia.

This report is an evaluation of the Country Education Project Charlton pilot project in which seven schools used the Telecom teleconference system to teach Higher School Certificate students Art, English Literature and Australian History during Term Two, 1982.

1.2 The Country Education Project.(C.E.P.)

In Victoria, the Country Areas program of the Commonwealth Schools Commission is known as the Country Education Project. The C.E.P. funds local educational programs which are designed to identify and overcome educational disadvantage to students caused by rural isolation. One of the unique features of the C.E.P. is its method of operation at the grass roots level. Rather than impose solutions to local problems from a central authority, the C.E.P. seeks to encourage schools to use local initiative through their appropriate area committees to solve their difficulties. The C.E.P. central organization is essentially a co-ordinating and revenue dispensing body which facilitates local groups to identify areas of concern and implement solutions to overcome them. It is therefore very responsive to local needs in the country. Both teachers and students working in small country high schools believe that their inability to take part in a wider exchange of educational ideas and their isolation from the mainstream academic and intellectual thinking in Melbourne are their main educational disadvantages. Students cannot gain an insight into the broad spectrum of other student ability with only three or four students in their class. This insight can only come when they discuss their study with other students and are stimulated and motivated by them. The Charlton C.E.P. pilot project is one of three pilot projects which is attempting to

provide two-way audio contact between schools to help to break down this feeling of isolation. The C.E.P. is also trialling two-way high frequency radio links between secondary schools in the Mallee during Term 3 of 1982, and conducting an experiment to interface Apple 11 computers with high frequency radio in north-eastern Victorian secondary schools during 1983. Both of these pilot projects will also be evaluated.

1.3 The Charlton Pilot Project.

1.3.1 Introduction.

The following schools in the Charlton or Kara Kara C.E.P. project area have been provided with the Telecom Australia teleconferencing system: Boort, Charlton, St Arnaud, and Wedderburn High Schools, Birchip and Wycheproof Education Centres and the McAuley College campuses at Donald and Charlton. That is, seven schools on eight locations, seventeen teachers and thirty-six students agreed to take part in the pilot project. Unlike many similar trials overseas local schools were given virtually all of the control over how they would use the teleconferencing system to overcome their educational disadvantage. They indicated to Telecom personnel that if the teleconference system did not provide the schools with anything worthwhile educationally, then it would be discarded. This implementation created some difficulties for the evaluation but it ensured that the teleconference system was trialled in a natural school situation without the complex support facilities so common in large scale overseas projects. Teachers were under no compulsion to continually use the teleconference system and they could implement their own procedures to derive maximum educational benefit from the teleconferencing system. This approach ensured that there was considerable validity in the trials and enhanced the importance of the teachers' and students' reactions to the system. The pilot project therefore provided an excellent opportunity to study the interaction between the setting, the learners and the interactive audio capacity of the

teleconferencing system.

1.3.2 Aims of the Charlton Pilot Project.

The principle aim of the project although not explicitly stated appeared to be to increase the degree of interaction between:

(a) country schools with small classes and correspondence students,

(b) country schools and home based correspondence students,

(c) teachers in nearby country schools, and

(d) parents and teachers in country schools and correspondence school teachers.

Secondly, to pool resources available in country schools and the correspondence school, and thirdly, to make better future use of reasonable cheap communication technology.(C.E.P. p 2-3)

1.3.3 Implementation.

Discussions were held with the local schools late in 1981 and the following three H.S.C. subjects were chosen to trial the teleconferencing system, English Literature, Australian History and Art. They were chosen because:

(i) the teachers of these three subject areas had volunteered in their respective schools to take part in the pilot project.

(ii) the student numbers taking these subjects appeared to be large enough to make the pilot project worthwhile but not too large to prevent each student taking part in worthwhile discussions.

(iii) these three subject areas have an emphasis on interpretation and therefore lend themselves to discussion technique. The staff of the Correspondence School supervising students in these subjects also agreed to participate in the project. There was a stated assumption that the system would work most effectively if,

(i) it was used regularly to teach specific aspects of a subject,

(ii) teachers can prepare programs on topics of personal interest,

(iii) the number of students in any one session are kept small. (C.E.P. p. 2)

The pilot project was implemented during term 2 in 1982.

Prior to Term 2, 1982, two in-service days were held for teacher participants in the trial. On March 25th, fourteen teachers and five of the school principals met to discuss the project. This meeting was held in conjunction with a general curriculum day at Charlton High School and because of the shortage of time, a further in-service day was planned for April 22nd. This second meeting was attended by sixteen teachers, and nine Telecom personnel, as well as Jenny Gibbons, a welfare officer from the Association for the Blind. The main aim of this in-service day was to show teachers how to use the teleconference system. Although the teleconference system was new to Australian schools, it had been used successfully by other organisations such as the Association for the Blind. (Albertson and Bearlin, 1977) Gibbons spoke of the unique features of communicating with this technology and she outlined some techniques which she found useful for counselling elderly blind people. The teachers met in subject groups later in the afternoon and the following subject co-ordinators for the pilot project were appointed, Mark Kelly, Boort High School-English Literature, Jenny Stankovic, Charlton High School-Art, and Brendan Monks, Boort High School-Australian History. Brendan Monks was asked to act as area co-ordinator for the pilot project. A timetable was drawn up for use of the teleconference system between 1.30 pm and 4.30 pm. This time limit was imposed by Telecom on the use of the bridge component of the system because of the busy morning trunk traffic on Telecom's Bendigo-Melbourne line. Prior to the commencement of the pilot project, staff of Telecom visited all participating schools at the beginning of June and installed the terminals. They gave the staff and students a further demonstration of how to use the equipment. The staff and students who were to use the

teleconference system also completed a questionnaire assessing their attitudes towards the system and other aspects of the trial.

1.3.4 The Teleconferencing System used in the Charlton pilot project

Teleconferencing is a broad term covering 'long distance discussion' of any type. (Monson et al 1977) For the purpose of this evaluation, the term' teleconference system' refers to the two types of equipment made available by Telecom Australia's Research Department to seven secondary schools. This equipment was built specifically for this project and was experimental and therefore not designed for sustained use. Consquently, some of the technical problems which emerged during the pilot project would not occur with commercial equipment. Firstly, the small group terminal was installed in each of the school locations. It was essentially a modification to an existing telephone and it enabled a small group of people at a single site to take part in a group-to-one communication or with another terminal in a group-to-group communication. It consisted of a plinth-style attachment to a telephone which incorporated infra-red transmission.

Fiqure 1. The Small Group Terminal (Photo-Courtesy, Telecom Australia)

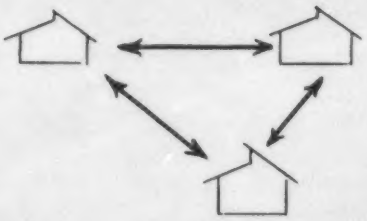
The number of teachers and students who could use the small group terminal in each location was limited by the number of infra-red receivers and the capacity of the central microphone to 'pick p' the voices.

The second device making up the system was the automatic bridge located in Melbourne. The primary function of this device was to link the terminals to each other. Although each device is an independent entity in its own right, the Research terminal and Research bridge were designed to complement each other. The teachers carried the remote terminal in a light-weight case to the room set aside for the conferences and prepared it for the 'link-up'. This involved assembling the central microphone, and issuing the headsets to the students who then inserted a small battery into each headset. They then dialled up the numbers to be contacted. The students were usually introduced by the teachers who then proceeded to describe the system and 'set the scene' for the people who were contacted. The teacher then briefly described what the students were studying and asked the first questions. They would then request their students to continue the questioning or comment on any of the statements made by the person who was contacted. At the end of the session, the microphone was detached from the terminal, the batteries removed from the headsets and the equipment was repacked in the storage case. This usually took approximately ten minutes.

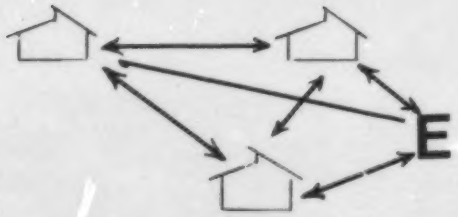
The teleconference system was used by the schools in three ways and these are shown in diagram form in Figure 4.

Figure 2. The Australian History Class at St Arnaud High School Using the Teleconferencing System. (Photo-Courtesy, Telecom Australia)

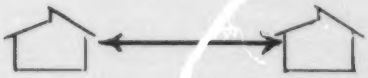
Figure 3. A close-up of the terminal and headsets being used by Brendan Monks and two of his Australian History students at Boort High School. (Photo-Courtesy, Telecom Australia)



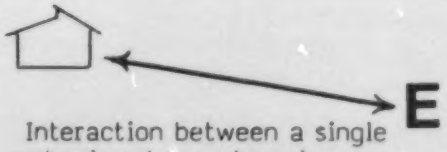
Interaction between three schools using the teleconferencing bridge.



Interaction between three schools and an external authority using the teleconference bridge.



Interaction between two schools with the small group terminal and without the teleconference bridge.



Interaction between a single school and an external authority using the small group terminal but without using the teleconference bridge.

Figure 4. Diagram of the Uses of the Teleconference System.

Firstly, a teacher would dial the automatic teleconference bridge in Melbourne and then by using the Touchfone 12 keypad on the terminal, he or she would dial up the special codes and numbers of the schools. Classes were then linked together in this way for several discussions and lectures by external authorities. Secondly, the facility was used by a teacher to contact another school and have a discussion or team teach a topic with two classes. Thirdly, the system was used by a teacher to contact a private number and then have a group discussion between the individual contacted and the teachers' class. These latter two uses did not involve use of the teleconference bridge and hence there was no restriction on when they could use it during each day.

The significant feature of the system is that participants can

talk to each other without the need to use manual switches or a voice activated microphone. The latter device often clips the last syllable from words and also makes it difficult for a chairman or convenor to intervene in an active meeting. Teleconferencing has been used extensively for business conferences and for use in education in the United States, Canada and the United Kingdom but apart from the School of the Air, it has been used infrequently in education in Australia. Some of these instances are outlined in the next section.

1.3.5 Alternative forms of teleconferencing used in education in Australia.

Australia's use of teleconferencing for education began with the School of the Air at Broken Hill in 1956. (Ashton, 1971, p. 1) It was realised that the 'pedal wireless' used by the flying doctor service could be used by students in South Australia to supplement their correspondence lessons. In Victoria, the Council of Adult Education has used loud speaking telephones to conduct teletutorials. Tutorial units were located in several provincial centres throughout Victoria and book discussion groups were held during 1975, 1976 and 1977. (Collins, 1978) The South Australian Education Department Educational Technology Centre has conducted a number of trials using technology in distance education. The most recent trial utilised loud speaking telephone, facsimile with two-way transmission, and slow-scan television. (E.T.C.-S.A., 1981) Another teleconferencing project currently being undertaken is the use of the ATS 1 satellite for the PEACESAT network The objective of this demonstration project is to study the benefits arising from direct conference communications between groups with common interests in widely separated countries in the Pacific. Co-operating institutions are linked by low cost self-contained radio terminals. (Seumahu, 1982)

Chapter 2 Evaluation Methodology.

2.1 Introduction.

Because the C.E.P. pilot programs are located in small country high schools with small student numbers in senior classes, any attempt to use formal experimental designs to evaluate this technology were inappropriate. There were insufficient students to provide experimental and control groups and the informal nature of the trials would make it extremely difficult to control all the variables. Becker (1978) has drawn attention to the fact that experimental studies of new technology are not sensitive to the gestalt of the setting, nor the intention of the learners. Therefore, a number of techniques were used to collect the data necessary for this evaluation. The evaluation model is closest to Parlett and Hamilton's illuminative evaluation. (Parlett and Hamilton, 1977) While the pilot project was evaluated in terms of its implicit objectives, interpretations and descriptions within the total context of the innovation were also undertaken and evidence of any unanticipated outcomes was actively sought. One theme within this broad structure was to focus on questions which would be relevant to decision makers. Teacher participants were asked to identify the key decision makers and questions to be answered by the evaluation. This was based on a procedure outlined by Patton (1978). He suggested that a worthwhile evaluation requires an ongoing commitment from the participants and they have to be involved in determining key attributes of the evaluation. Accordingly, teacher participants were given the opportunity to determine questions and decide the evidence which would indicate success or failure of the teleconferencing system.

2.2 The Educational Setting of the Trial.

2.2.1 The schools.

The seven schools are located in central Victoria in a

wheat-sheep raising area. Two highways, the Calder and the Sunraysia cross the area and all schools with the exception of Boort High School are located on one of these highways. The district is approximately 300 kilometres from Melbourne and approximately 100 kilometres from Bendigo, the regional education head office. Table 1 outlines some demographic characteristics of each school.

TABLE 1

Staff Numbers and Experience and Students Numbers in the Schools.

	Birch High	Boort High	Charlton High	McCauley Charlton	McCauley Donald	St Arnaud High	Wedderburn High	Wycheproof High
Number of Students	154	174	133	264		270	175	160
H.S.C. Students	13	7	10	12		16	7	7
Form V Students	25	19	21	25		34	22	27
Number of Staff	25	23	21	21		27	22	24
Staff Teaching Experience								
0-2 years	2	2	3	---		11	4	6
3-5 years	4	15	3	---		8	5	10
over 5 years	18	6	12	---		11	13	8

All the schools have enrolments of between 150 to 200 students with the exception of McAuley College which is located in two towns, Charlton and Donald, and St Arnaud High School. The student numbers taking H.S.C vary from seven to sixteen. This is small by metropolitan standards, and consequently, H.S.C. classes would also be very small. With the exception of Boort, Wedderburn and St Arnaud High Schools, the majority of staff had more than five years experience in the classroom.

Schools were asked to provide estimates of their postage and telephone expenditure and the destination of these communications. These are outlined in Table 2.

TABLE 2

School Expenditure on Postage and Telephones.

	Birchip High	Boort High	Charlton High	McCauley Charlton	McCauley Donald	St Arnaud High	Wedderburn High	Wycheproof High
Approx. Telephone and Telegraph Costs.	5000	3000	1800		2000	2500	2500	1500
Percentage to :								
Local calls	10	10	10		60	10	20	5
Neighbourhood schools	5	5	10		5	15	---	25
Bendigo	25	20	30		5	15	30	20
Melbourne	60	60	40		20	10	50	50
Other locations	10	5	10		15	5	---	5
Amount spent on Postage	600	250	500		200	500	800	400
Percentage spent on :								
On locations within 10km	---	5	10		25	10	10	10
Neighbouring towns	5	5	20		25	15	10	10
Bendigo	10	20	30		5	15	30	20
Melbourne	65	60	30		45	40	50	50
Others	20	10	10		25	5	---	10
						15% to Ballarat		

With the exception of McAuley College, most postage and telephone expenditure is for destinations in Melbourne. This is a reflection of the centralised administration of the Victorian state education system and the greater local autonomy of McAuley College. The current restructuring of the Victorian Education Department will redirect some of this communication to Bendigo. Numerically, local telephone calls and postage may be greater than other destinations but because of the greater cost of communication to Melbourne, it represents the greatest financial outlay. A further interesting feature is the relatively small percentage of total budgets spent by schools on communication with neighbouring schools. The exceptions are McAuley college with its multi-campus location and Wycheproof Education Centre and Charlton High School.

Table 3 outlines the number of interschool visits made by staff and students.

TABLE 3

Interschool Visits Within the Region
(number of individuals x number of visits)

	Birchip High	Boort High	Charlton High	McCauley Charlton	McCauley Donald	St Arnaud High	Wedderburn High	Wycheproof High
Staff Visits :								
Sports Supervision	100	70	16		6	8+	70	26
In-service	20	46	2		21	10+	40	34
Special lectures	10	--	3		3	6+	5	-
Student Visits :								
Student activities	5	500	160		64	8+	700	180
Special lectures	-	-	20		-	40+	15	-

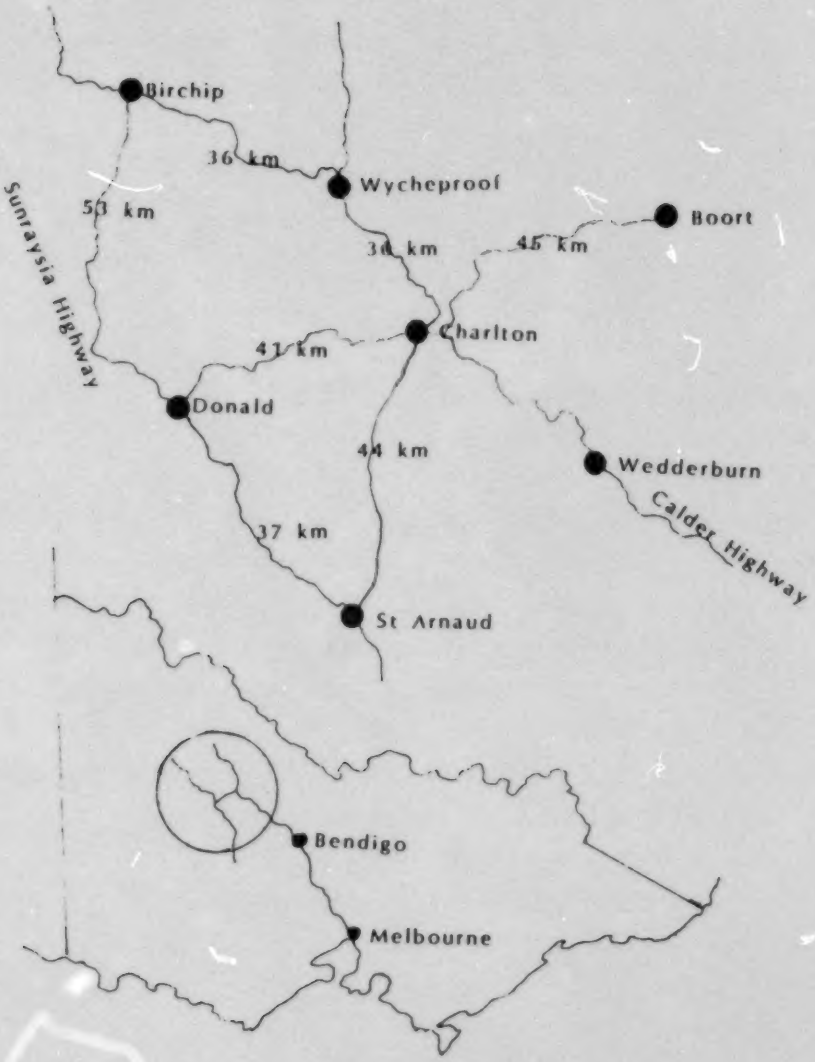


Figure 1 Location of the Group of Schools in Victoria.

The schools as Figure 1 indicates, are located in a semi-circle around Charlton and are all approximately within one hours drive of Charlton. They therefore form a geographic network and Table 3 indicates that this is reinforced by schools competing against each other in inter-school sports and the staff

and students occasionally meeting for joint curriculum days. The educational interaction between the towns is also paralleled by adult inter-town sports meetings. The region therefore has a unity and inter-town relationship which is further reinforced at the family level by some students having relatives in the other towns.

2.2.2 The teachers participating in the pilot project.

The seventeen teachers who volunteered to use the teleconference system were in general experienced teachers. Of the eleven of these teachers who completed the Telecom survey at the beginning of the pilot project, seven had been teaching for more than five years. Since they had volunteered to take part in the pilot project, they could be considered innovative teachers who would be receptive towards any new technology which improved their effectiveness as teachers. There was no time allowance or any remuneration given for their participation and therefore it seems reasonable to conclude that their motivation was a genuine desire to explore the value of the system.

2.2.3 The students participating in the pilot project.

There were thirty-six H.S.C. students participating in the pilot project. Although no tests were given to the students to determine their ability or their degree of introversion/extroversion, there was no reason to believe that any one student attribute would have a profound impact on the outcome of the pilot project.

2.3 Procedures for Gathering Data.

2.3.1 Logbook.

Logbooks were printed and distributed to the eight locations in the pilot program. (Appendix B) Teachers were asked to record the date and time they used the system, the persons contacted, the length of contact, the clarity of speech and other general remarks of value to the evaluation. It was anticipated

that this book would provide a continuous record of the frequency and duration of the use of the system. Telecom installed a recording device on the teleconference bridge in Melbourne to provide them with a list of phone numbers contacted and the duration of each call.

2.3.2 Questionnaires designed to survey teacher and student opinions after each session on the teleconference bridge.

The questions on the teacher questionnaire dealt with the following aspects of the use of the teleconferencing system:

Question 1. The impact of the system on student learning.

Questions 2 -10 Teacher attitude toward the system.

Questions 11-22 Characteristics of the discussion.

Question 23. The amount of the preparation necessary.

Question 24 Student oral response.

Question 25 Additional comments. (Appendix C)

The questions on the student response forms dealt with the following:

Question 1. Frequency of participation in discussions in an average face-to-face class.

Questions 2-15 Reaction to using the teleconference system.

Questions 16-18 Impact of the teleconference system on understanding topics studied.

Questions 19-24 Characteristics of the discussion.

Questions 25-28 The teleconference system relative to other types of learning.

Question 28 Level of verbal participation

Question 29 Additional comments. (Appendix D)

Both teachers and students were issued with questionnaires which were to be completed each time they used the system. In order to minimise the time taken to complete the forms, nearly all the questions were five point Likert type scales which

required participants to indicate their reaction to a statement by marking a number on the form. However, because it was becoming difficult for teachers and students to complete the forms after each session, it was decided to reduce this exercise, and three separate weeks were sampled at approximately equal intervals and the participants were asked to complete their forms during these weeks. As some schools did not use the teleconference system during these weeks, they did not complete the forms. Several of the questions, particularly those referring to participants' attitudes towards teleconferencing and those referring to the attributes of the current session were taken from studies by Lamy and Villardier (1979) and Weston and Kristen (1973).

2.3.3 Interviews with Principals, teachers and students.

Two visits were made to the schools to interview Principals, teachers and students participating in the pilot project and observing sessions of the system in use. Principals in each school were questioned on their reaction to the teleconference system, its general impact on education in their school and their willingness to pay for the teleconference system.

In the first interview approximately five weeks after the commencement of the pilot project, the teachers were questioned on their general feelings about the teleconference system, the impact of the teleconference system on their teaching strategy and some more general questions about its impact on curriculum development and preparation.

The second interview one month after the first dealt with general reactions to the teleconference system. Although questions were prepared for each interview, in some instances these were not used if the discussion appeared to be providing more useful feedback or insights into new areas. The students were asked some pre-planned questions and the interviews mainly concentrated on the impact of the teleconference system on their knowledge and discussion techniques. Because of the importance

of the individual teachers in determining how the teleconference system would be used, they have been quoted at length in this evaluation. For convenience, their names and the schools where they teach have been listed in Appendix A.

2.3.4 Coding of verbal interaction in some sessions.

Two forms of observation of verbal interaction were used in the evaluation of the teleconference system. During the visits to the schools, the actual use of the bridge was observed in two sessions. In addition, the evaluator was contacted on one occasion and connected to the bridge and was able to listen to the verbal interaction during the session. Notes were taken of four critical traits of communication. Firstly, the degree of formality or structure imposed by the system. Secondly, the direction of message flow during the communication. In particular, whether the communication was vertical, that is, teacher to student or horizontal such as teacher to teacher or student to student. Thirdly, the initiation of the interaction. That is, whether it was the teachers or students who were initiating the contacts and finally, the level of information load on the participants or whether they could adequately process the information they received in each session. Notes were also taken on the type of preparation necessary for the session and the references made during the session to this preparation.

2.4 Limitations to the Evaluation.

There were a number of constraints to the evaluation which are common to many short-term projects of this type. White (1979) warns of the effect of novelty on trials involving relatively complex and new technology. Obviously the co-operation individual teachers received when they contacted prominent politicians, academics and Aboriginal community leaders was partly due to this effect and would be more difficult to obtain if the teleconference system became a permanent facility of Victorian schools. In addition, student participants were

generally excited about being involved in an innovatory project and were more likely to be positive in their attitudes towards the system.

The system was also made available at no cost to the users. Table 2 gives an indication of the annual expenditure of the eight locations on telephone communication. Obviously, long distance trunk calls lasting 1 1/2 hours are too expensive for individual schools. One would expect that the usage rates for the system would be inflated when schools were not charged for its use.

Johansen (1976) warns that initial uses of teleconferencing systems often serve as a poor basis for generalising about future uses. It is a temptation to evaluate teleconferencing in terms of face-to-face communication but over time, communication patterns more authentic to the medium will appear. Because the trial was only taken over twelve weeks, it was unlikely that alternative uses of the teleconference system would emerge. The very short planning time that schools were given also compounded this difficulty. Hence there was a risk that the teleconference system would be under-valued in terms of how frequently it was being used and the variety of its uses.

The difficulty of undertaking an evaluation some 300 kilometres from the schools is a further limitation. While teachers were requested to contact the evaluator and link him in to teleconference sessions, this did not happen very often. Generally shortage of time was given as a plausible reason.

Financial and time constraints meant that only two visits could be made to the schools. This disadvantage was reduced by the co-operative attitude of the Principals and teachers and students.

A further constraint often mentioned by teachers was the conflict between giving students time on the teleconference system to provide sufficient evidence to enable an assessment of its worth to be made, and conserving precious student time for normal classes. H.S.C. students are under considerable pressure

and the teachers were reluctant to give up too much time.

None of these difficulties in themselves rendered the evaluation invalid but certainly, they imposed limitations on the interpretation of the data.

Chapter 3..Literature Review.

While an extensive literature review of the use of teleconferencing in education is not appropriate for this evaluation, some reference to literature is necessary to provide a background and a theoretical framework for the discussion of the system. Audio teleconferencing although new to Australian primary and post-primary schools has been used extensively overseas in education. Parker(1980) has provided a useful summary of this application. The first recorded use was in 1939 when Dr. Winterstein initiated a project to meet the needs of home bound and hospitalised students. The sixties saw a rapid increase in its use in the United States with many institutions providing courses using teleconferencing and the seventies saw further growth and diversification in its uses. Teleconferencing has been used in New York State to teach chemistry to secondary students. Once a week, they were bussed to a laboratory in a central school for practical work. However most examples of its use are confined to the more sparsely populated western states. Nevada, Oregon, Idaho and Utah have used amplified telephones and co-ordinated overhead visuals to teach art and five small Colorado schools have used this technology to teach American History. In addition, the teleconference system has also been used to instruct teachers in mathematics, language, reading diagnosis, issues in education and teaching methods. (Parker and Monson 1978)

Parker (1980) identifies five main modes of use for teleconferencing in education. Telelecture is the simplest form. It is a pre-arranged phone call from the classroom to an external resource person who provides expertise not normally available. Students can make comments and ask questions during the telelecture. Secondly, the teleconference system can be used for teleteaching where a homebound student can keep up with a class while not actually being present. Thirdly, the system has been used for teletutoring where students in several locations can contact a teacher for individual help. It is mainly used

overseas as a supplement to correspondence education. Fourthly, telephone-based instruction enables students in several locations to contact their instructor and finally, telewriting involves supplementing the audio communication with a device which enables hand drawn graphics to be transmitted through the telephone lines.

This analysis is useful for the current evaluation. There have been three main uses of the system in the Charlton pilot project. The simplest use has been for telelecture. The second use approximates to telephone-based instruction where two or more classes have been linked together to discuss a common topic and finally, the system has been used for administrative or organisational meetings. This framework provides the necessary structure to enable an analysis of the use of the technology to be undertaken in the next chapter.

Chapter 4 Frequency and Type of Use of the System.

The following analysis is based on Parker's categories of educational teleconferencing and on whether the schools used the automatic teleconference bridge. The schools have used the teleconference facility in the following ways:

4.1. Multiple school use by more than two schools where they have been linked together by the automatic teleconference bridge.
The schools have used this configuration for:

4.1.1 Telelectures where outside speakers have been brought on to the system and linked to more than two schools.

Elsie Anderson, Shane Cahill and Bob Lewis, three examiners in Australian History were linked to Boort and Charlton High Schools and McAuley College, Charlton for lectures. Professor Weston Bate spoke to students at Wedderburn, Charlton and St Arnaud High Schools and Professor Bradley delivered a lecture on the Shakesperian play, King Lear to students at Boort, Wedderburn and St Arnaud High Schools.

4.1.2 Telephone-based instruction where three or more schools were linked together by teleconference bridge to study a pre-determined topic.

Boort, Wedderburn and St Arnaud High School students and their respective teachers discussed aspects of the play, King Lear using the teleconference bridge. Usually students prepared questions and outlines of answers and read them over the bridge and were then questioned by the other participants. Charlton, Boort, Wycheproof, Wedderburn and St Arnaud Art students listened to a lesson on 'The Correspondence Between Man and Landscape in 20th Century Australian Painting'. Also a talk was delivered by Brendan Monks, the Boort Australian History teacher to his own students and students at McAuley College, Charlton and Charlton High School on strikes in the 1920's.

4.1.3 Telediscussions where teachers in all participating schools were linked together to discuss common interests.

On 15th June, teachers in the Kara Kara Computer Sub-committee held a meeting using the teleconference bridge and on the 9th July, principals of the schools used the teleconference bridge to discuss aspects of T.A.F.E.. On the 27th July, a further meeting was held with Dr Ritchie, Executive Director, Personnel and Resources to discuss the possible deployment of music teachers within the group of schools.

4.2. Single or dual school use without the automatic teleconference bridge.

Because of the wide choice of electives in some subject areas, sometimes only one or two schools were studying a common topic within a subject. They have used the system, but not the teleconference bridge in the following ways:

4.2.1 Telephone-based instruction where the two Australian History teachers in St Arnaud and Wedderburn High schools have successfully linked their schools for discusssions and some team teaching. Wycheproof and Birchip Politics students have also had two links to discuss common topics.

4.2.2 On a number of occasions, two schools used the system to organise and plan further use of the system for telephone-based instruction purposes.

4.2.3 Individual school use for telelectures.

Because of the wide choice of electives particularly in Australian History, some schools have been studying topics not taught in the other schools. This has meant that their use of the system had to be confined to the telelecture mode where outside speakers have been linked to the school Eileen Smith of Birchip High School has contacted a number of authorities on

Aboriginal affairs and Aboriginal leaders throughout the Commonwealth. She has contacted Eve Tesh from the Department of Aboriginal Studies, Monash University, staff from the Aboriginal Advancement League and missionaries working with Aboriginals. Greg McIntosh of Wycheproof Education Centre contacted nine prominent politicians or past politicians to provide additional information for his H.S.C. Politics class. Gough Whitlam spoke about the 1975 constitutional crises and The Right Honourable Doug Anthony M.H.R. spoke about the impact of the 1982 Federal budget. When it was used in this way, the teleconference system provided a link similar to one which could be provided by a loud speaker telephone.

Table 4 outlines the types of use for each week during Term 2. The use of the system has been relatively constant during the term and averaged slightly over one contact per week per school for each week. At least two-thirds of the contacts have been organisational. In order to arrange the telelecture with the Right Honourable Andrew Peacock, Greg McIntosh had to make four short telephone calls to his office.

TABLE 4
Teleconference System Use by Type of Use

Week Ending	Multiple School Use With the Bridge			Use Without the Teleconference Bridge			
	Organizational	Telelecture	Telephone-based Instruction	Organizational	Telephone-based Instruction	Telelecture	Total
June 11	5	-	1	29	-	-	35
18	3	-	-	11	2	2	18
25	-	-	2	3	-	2	7
July 2	-	1	1	9	-	2	13
9	2	3	1	-	-	-	6
16	-	-	2	1	1	1	4
23	1	-	2	4	-	4	11
30	2	-	1	-	-	-	3
Aug 6	-	-	-	14	1	2	17
13	1	-	-	4	1	3	9
	--	-	-	--	-	--	---
Total	14	4	9	75	5	15	123
	--	-	-	--	-	--	---

Table 5 outlines the use made of the system by each individual school. The most frequent users in terms of contacts have been Wycheproof and Birchip High Schools. Most of their use has been for single school telelectures and it is only in the latter part of the term that the schools have combined to use the system in the telephone-based instruction mode. This was because the system was originally confined to the three subject areas. It also reflects the considerable number of organisational telephone calls which are often necessary before an outside authority can be linked to the schools. McAuley College, Donald have also used the system to contact an external speaker.

TABLE 5

Teleconference System Use by School

	Multiple School Use With the Bridge			Use Without the Teleconference Bridge			
	Organ-izational	Telelecture	Telephone-based Instruction	Organ-izational	Telephone-based Instruction	Telelecture	Total
Birchip	4	-	-	29	1	4	37
Boort	3	3	5	-	-	-	11
Charlton McCauley	7	3	3	-	-	-	13
Charlton McCauley	3	1	1	-	-	1	6
Donald	3	-	-	3	-	2	8
St Arnaud	2	1	1	2	3	-	9
Wedderburn	4	3	7	1	2	-	17
Wycheproof	1	-	3	39	2	8	53

The other schools have either used the bridge for telephone-based instruction or telelecture and all schools have taken part in telediscussion such as Principals' meetings and Kara Kara Computer Sub-committee meetings.

4.3 Duration of the use of the teleconferencing system.

The teleconferencing system was used for 2,249 minutes during the trial. The details of the length of each type of use are summarised below:

Multiple school use with the teleconference bridge.

	Number Sesions	Duration in Minutes
Organisational	14	370
Telelecture	4	285
Telephone-based Instruction	9	490
Total		1145

Single or dual school use without the teleconferencing bridge.

Organisational	75	236
Telephone-based Instruction	5	285
Telelecture	16	595
Total		1116
TOTAL		2261

The average length of each type of session is summarised below:

	Number Sessions	Duration Minutes	Average Duration
Organisational	89	606	6.8m
Telephone-based Instruction	14	775	55m
Telelecture	20	880	44m

The average length for organisational contacts has been inflated because it includes three meetings of approximately one hour each between the school principals and members of the computer sub-committee.

One of the criticisms often directed at evaluations of teleconference systems is that they do not assess the effectiveness of the system but the client level of satisfaction with the system. Parker and Monson, (1980) recommend a framework originally presented by Casey Stahmer and Havron (1973) for the evaluation of a teleconference system in education. They suggest that teleconferencing can achieve three things. It can provide extended access to education, it can be atimesaver, and it can save money. The next chapter examines the success of the teleconference system used in the Charlton pilot project in accomplishing these three functions.

Chapter 5..Success of the Anticipated Goals

The Charlton pilot project sought to provide extended access to education by increasing the degree of interaction between several groups.

5.1 Success of the technology in increasing the degree of interaction.

5.1.1 Between country schools with small classes and correspondence students.

The system has not been used to link correspondence students in schools to classes in neighbouring schools in the subjects they are taking by correspondence or to link correspondence students to their supervisors in the correspondence school in Melbourne. There are several reasons for this.

Firstly, there are only a small number of students in the schools taking subjects by correspondence and in only one instance is there more than one student taking the same subject. Principals have discouraged their students from attempting a H.S.C. subject by correspondence and one Principal indicated that he would only let students attempt them if he could timetable a teacher to provide assistance to the student for at least two periods per week. Therefore, the correspondence students in his school already have access to the verbal interaction that would be provided by the teleconferencing system.

Secondly, correspondence students within the district tended to be overlooked in the trial because they did not have one teacher to represent their interests within the group of schools. This would have added another untimetabled responsibility for the teacher and no compensatory provision was made in the pilot project for this. Such a teacher would have to become familiar with the printed material which the Correspondence School distributed to their students. Therefore, the small number of correspondence students in the area and the diversity of their subjects militated against using the teleconference system in

their situation.

5.1.2 Interaction between staff in neighbouring schools.

The system has been very successful in promoting interaction between Principals and staff in schools participating in the pilot project. All of the teachers interviewed indicated that they had established stronger links with their counterparts in other schools. They felt that previous to the project, they may have known of teachers in other schools but now they had developed a stronger professional relationship. Several teachers have commented and given concrete examples of instances where they have become aware of resources through their links on the teleconference system. However, there are also other ways that this has been achieved within the group of schools. Helen Price commented on the value of the H.S.C. Art camp held at Boort in promoting professional links and Robert Bray commented on the value of the face-to-face contact which occurs between teachers during one day seminars.

The Principals have used the link on three occasions. The first was a forty minute discussion of T.A.F.E. Generally, the six Principals interviewed about this meeting indicated that the teleconference system had potential. Obviously, they were inexperienced in using it to conduct meetings and it took much longer than a face-to-face meeting to reach a decision. One further difficulty indicated by Peter Milward, Charlton High School Principal who was the Chairman for the first meeting was the danger of overlooking some participants. These meetings need to be well structured and the nature of the subject matter probably has a considerable impact on the effectiveness of the meeting. Meetings which involve some participants trying to persuade other participants to accept a proposal are likely to be more inefficient than information exchanging meetings. The discussion of T.A.F.E. appeared to be an example of the first type. A further meeting was held between the Principals and Dr. Ritchie who was visiting Boort High School. Each of the

Principals was able to express opinions to Dr. Ritchie while remaining in their own schools. This meeting according to Principals was very successful. Teacher members of the Kara Kara computer sub-committee have also used the system for meetings. It is significant that the teachers with an interest in computer studies have used this technology to transfer information. They were not amongst the original groups designated to use the system and the fact that they have organised themselves to make two link-ups is an indication of the need to transfer this type of information between schools. Only one other teacher not in the original seventeen has sought to use it on a continuous basis. There are several reasons for this. Originally, the teleconference system was to be confined to the three subject areas and the teachers who volunteered to take part in the pilot project were to be its sole users. There was the feeling that its use should be confined to those teachers who had volunteered. Secondly, some of the participating teachers commented that other teachers had asked them questions and observed some of the sessions but because they tended to be 'caught up' with their own work, they did not show any interest in using it. In addition, this technology requires considerable organisation between schools and individual teachers could not simply use it by themselves.

A further desirable development has been the increased co-operation between the McAuley College-Charlton Australian History teacher, Graeme Kelso and Graham Willis, the Charlton High School Australian History teacher. Both teachers are now co-operating closely in the exchange of resources for the mutual advantage of their students.

5.1.3 Interaction Between School Staff and Students and External Authorities.

The teleconferencing system has been very successful in linking schools to a diverse range of external expertise. The following people have been contacted for extensive verbal

interaction using the system:
Elsie Anderson
Shane Cahill
Bob Lewis Australian History examiners
Professor D. Bradley
Professor Weston Bate
Senator Missen
Andrew Peacock MHR
Senator D Chipp
Sir John Gorton
Barry Jones MHR
Gough Whitlam
Doug Anthony M.H.R.
Senator Gareth Evans
Senator Button
A Chalmers, Department Head, Salisbury CAE
Kay Iseman Lecturer Salisbury CAE
Eve Tesh, Department of Aboriginal Studies-Monash University
Elizabeth Hoffman, Aboriginal Advancement League
Department of Aboriginal Affairs
Guy Hassell, Horsham CES
Father John, a Catholic Missionary

The evidence obtained from logbooks, interviews, questionnaires, and participant listening suggested that all of these 'contacts' have been fruitful and have made a valuable contribution to the education of the H.S.C. students who have taken part in the discussions.

They were utilised in two ways. Usually, the academic contacts gave a prepared lecture and were available for questioning after the address or at points during its delivery. The names of the students participating were sent to lecturers and in at least one instance, the lecturer directed questions to individual students during the course of the lecture.
In the case of the 'political contacts', the teacher and students each prepared up to ten questions prior to the session. The

teacher would usually ask the first questions and then encourage students to ask their own or follow up comments made by the speaker. Students participated in these sessions to varying degrees and this usually corresponded to their verbal involvement in a face-to-face class lesson. One telelecture was observed at Birchip High School when a member of the Aboriginal Advancement League was contacted. The three students had prepared questions for the session. The teacher asked the first questions and one other student made comments and asked two questions. While most of the interaction was between the teacher and the person contacted, the discussion in the class which occured after the telelecture was excellent. The students compared the speakers comments with those made by previous speakers and they frequently referred to notes which they made during the discussion. While the actual verbal interaction on the system could have contained more student contribution, the discussion after the link indicated that it had been an educationally stimulating experience. The students had to concentrate hard during the session but they gave no obvious indication that they were having any difficulty. Apart from some individual difficulties in setting up the terminal, the equipment functioned very well and the sound quality was very good.

There have been some further benefits from this direct verbal contact. Speakers and authorities have sent and continue to send valuable literature to the schools and the Wycheproof HSC Politics class has visited Canberra for the budget session and personally met Senator Chipp, and the Right Honourables D. Anthony MHR and P. Fisher MHR. The teachers who have participated in these sessions were enthusiastic about their value to country students in small schools. They can also be justified in terms of cost-effectiveness when travel and accommodation costs for visiting speakers are considered.

5.1.4 Interaction between classes in neighbouring schools.

Interaction between small classes in separate schools using

the teleconferencing system has taken place in the following subject areas and between the following schools:

Art- between Birchip, Boort, Charlton St Arnaud, Wedderburn and Wycheproof High Schools.

Australian History- between Boort, St. Arnaud, Wedderburn and Charlton High Schools and Mc Cauley College, Charlton.

English Literature- between Boort, Charlton and Wedderburn High Schools

Politics- between Birchip and Wycheproof High Schools.

Table 4 indicated that there were twenty links between small classes in the schools using the system. Given that the schools were not being charged to use the system, this rate of use may seem low. However the teachers and students have indicated during interview, a number of reasons for this low rate of use. The greatest constraint to the multiple school use of the system has been organizational. There are several facets to this problem. Probably the basic difficulty is with the variation in timetables betweeen schools. This creates at least two difficulties. The first is in the variation between schools in the starting and finishing times of individual periods and recess and lunch times. During one 'telephone-based instruction' session in Art, the Birchip class had a commitment to their next class and had to leave the session. Secondly, rarely are subjects in two or more schools timetabled at the same time. The fact that the bridge component of the system was only available in the afternoon and some teachers only taught their classes in the morning was a further constraint in some schools. Frequently, teachers who took part in the pilot project had to impose on the 'goodwill' of other teachers in the school and had to 'borrow' students for the teleconferencing session. This goodwill was, without exception, forthcoming in all schools, but obviously, cannot be relied upon if the system is to be introduced into schools on a permanent basis.

Often a number of telephone calls were required to contact external speakers and brief them on the topics required and on

the nature of the system before they used it. One teacher commented that she spent three hours of phone calls to arrange a one hour lecture by an external speaker. In some instances, the ratio of preparation time to actual lecture time was 3:1 and some teachers suggested that it was higher for some speakers. Obviously, in the context of this trial, the ratio was too high to continually repeat the telelecture mode.

In addition, in this pilot project, it was the responsibility of individual teachers to arrange external speakers. Clearly, some teachers were more capable of doing this than other teachers. Some were able to use their previous associations with academic staff to arrange lectures. All the people contacted were willing to take part in the pilot project, but in some instances, particularly with prominent politicians, it was difficult to arrange suitables time for their lectures. On one occasion, a teacher was given twenty-four hours notice of the speakers availibility. Clearly, those teachers who were prepared to devote more time to planning and to persist with their attempts to contact a certain speaker usually succeeded.

Further, teachers were conscious of the fact that the system was time consuming for their students in a year in which time is very important to them. Some teachers suggested that they might be limited to three external lectures per year per class because of a shortage of class time. One teacher arranged for her students to be exempted from sport to make up for time they missed in written expression.

There were further difficulties when more than one teacher was using the system with teachers and classes from other schools. This appeared to create difficulties for the teachers of English Literature where three teachers and their classes discussed King Lear using the system. As Mark Kelly stated, this meant that he became 1/3rd of a teacher and the parameters setting out when he could intervene and impose his control on students in the other classes were not outlined. This led to uncertainties and hesitancy which the teachers claimed was

reflected in the quality of discussion. Obviously this problem is not insoluable but in the context of the eleven week trial, teachers did not have the time to develop the procedures necessary to improve the discussions. There are some important organisational problems to be overcome before the teleconference system could be used successfully in this mode in Victoria. Individual teachers have responsibility and accountibility for the education of the students in their classes. In small country high schools, they have a close personal relationship with their students. The use of the teleconference system required the teachers to accept some responsibility for another teacher's students. This was successfully done between two teachers in Australian History and later in the trial with Politics but was less successful with more than two classes. Art proved to be a difficult subject to teach using the teleconference system because of its reliance on visual images. These had to be available in all the schools in order that the teacher taking the session could refer the students to the appropriate illustration.

A further limitation to class interaction was the small size of the classes. Paradoxically, while this provides one of the principle justifications for using the system, it also contributes to one of its weaknesses. When one or two students are absent from a session, its value to the remaining students may be restricted. Boort High School was unable to participate in one Art session because the school's Art students were absent on the same day.

Finally, each individual school had long term commitments to activities such as examinations and trips to Melbourne and they were unwilling to re-schedule these for the teleconference bridge. Two telephone-based instruction sessions were heard on two occasions. On July 12th an English Literature session involving students of Boort, Wedderburn and St Arnaud students was observed at St Arnaud High School. The students had prepared answers on the significance of various characters in the play, King Lear. Most of the spontaneous interaction was teacher to teacher and

only on one occasion did two students conduct a sustained verbal interaction together. Most of the initiating of contact was done by the teachers. They later commented that there was a tendency for the discussion to lapse into silence on important issues without resolving anything concrete for the students. The link was made quickly and the sound quality was good. Towards the end of the session, there was some extraneous noise fed into the system from Wedderburn.

The second telephone-based instruction session was in Art and this was heard in Melbourne. A lecture was given by Jenny Stankovic, Charlton High School Art teacher. She had distributed a paper to Wedderburn, St. Arnaud, Wycheproof and Birchip High Schools. The session was formal in that she read from the paper and occasionally discussed points she had made. Most of the verbal interaction was between the teachers. She spent some time instructing other participants to find the appropriate illustrations she was referring to in her lecture. This telephone-based instruction mode of using the system has been the most difficult and it has highlighted the need for adequate planning and preparation.

5.1.5 Other community use.

Although there has been no use of the system by non-educational groups, Heather Malseed indicated that interest has been shown by the St Arnaud hockey club in using the system to contact clubs in neighbouring towns.

5.2 Success of the teleconference system in saving time.

Within the context of this pilot project, no attempt has been made to formally measure the overall impact of the teleconference system to save time. Some observations can be made.

Firstly, the arrangement of outside authorites and telephone-based instruction sessions has been very time consuming for individual teachers. However, when one considers the time

that speakers would spend in travelling to the district, and the time students and teachers would spend travelling to a central location, in the district, there is a considerable saving in time. Several principals commented that the meetings which they held did save them travelling time There is also the added advantage that the principal is available in his school to attend to administration. Apart from these two uses, the system has the added potential of saving student time in acquiring difficult concepts from printed material. However, because correspondence students were not involved in this pilot project, there was no way of establishing this.

5.3 The success of the teleconference system as a money saver.

The economics of the teleconference system are considered in Chapter nine. Chapter 6 provides a summary of the attitudes of participants towards the teleconferencing system.

Chapter 6 Attitudes towards teleconferencing and the levels of acceptance of the system.

Attitudes towards teleconferencing and the level of acceptance of this form of communication were sought from Principals, teachers and students by questionnaire and interview.

6.1 Principals' attitudes towards the system.

All seven principals have expressed support for the teleconference system. They regarded it as an excellent addition to their schools. The system did not disrupt the organisation of their schools other than the necessary timetable adjustment. There was no additional strain on office staff as Telecom had installed an additional line into the schools solely for the teleconference system.

6.2 Teacher attitudes towards the system.

Prior to the pilot project, Telecom obtained an assessment of teacher and student attitudes towards the teleconferencing facility. Of the eleven teachers who completed the survey, seven were extremely favorable towards the teleconference system, two were favorable, one was slightly favorable and one teacher was unfavourable. Four of the teachers felt that they prefered to receive information from visual sources rather than auditory and all felt that they thought learning to use the teleconference system would be reasonably easy.

Teacher attitudes towards the teleconferencing system were also obtained during the trial from the two interviews and several questions on the teacher questionnaires were concerned with attitudes towards the system. On the basis of the responses to the nine questions related to teacher satisfaction in the questionnaire, Table 6 has been compiled. The mean is calculated for each of the statements and the frequency distribution is given for each of the ratings.

TABLE 6
Teacher Attitudes Towards the Teleconference System

	Mean	Frequency					
		Strongly agree	Agree	Don't Know	Disagree	Strongly Disagree	Not Applicable
		5	4	3	2	1	0
Q. 2. The lack of confidentiality has had no effect on my teaching.	4	3	5	1	1	-	-
Q. 3. I was able to ask questions and invite responses freely during the session.	4.1	9	5	-	1	-	1
Q. 4. I was willing to say things more freely using the teleconferencing system than I would in a normal face-to-face class situation.	2.6	1	-	7	3	2	4
Q. 5. This type of technology makes me feel that I am constantly being observed by those at the other end.	2.0	-	2	-	5	4	6
Q. 6. It was hard to know who was talking at the other end.	2.6	1	4	-	5	3	4
Q. 7. I was sometimes uncertain whether the people at the other end were listening.	2.3	-	2	3	4	3	5
Q. 8. I was happier using the technology this session than the previous occasion.	3.3	2	5	1	1	2	5
Q. 9. I think that if all the participants were in the same room, the discussion would have been better.	3.2	2	5	6	1	2	1
Q. 10. I found it easy to manage the responses during my session.	4.1	5	7	1	1	3	3

The nine teachers who completed the questionnaires were happy with most aspects of using the system to communicate. They were not troubled by any lack of confidentiality; they could ask questions freely; they had no feeling of being observed or monitored; they had no difficulty knowing who was speaking; they felt that people were listening; they found it easy to manage responses and they indicated that their satisfaction with the teleconference system increased each time they used it. There was some support for the contention that the discussions would have been better if the participants were in one room and they were either undecided or they disagreed that they would say things more freely using the teleconferencing system than in a normal classroom.

Teacher feelings towards the discussions were measured using twelve scales and the results of their ratings are outlined in Table 7. The factors that were assessed were value, activeness, receptivity, variety, planning, relevance and co-operativeness. Using the system of scoring shown in brackets on Table 7 the following means were calculated:

Evaluation	Dissatisfying/satisfying	4
	Useless/useful	4.2
	Productive/counter-productive	3.3
	Good/bad	4.2
Activeness	Dynamic/static	3.3
	Lively/dragging	3.6
Receptivity	Boring/interesting	4.2
	Relaxed/tense	3.9
Variety	Varied/repititive	3.3
Planning	Aimless/directed	4.2
Relevance	Probing/superficial	3.2
Co-operativeness	Co-operative/competitive	4.0

In summary, the teachers assessed the sessions as being valuable, interesting, and co-operative. The sessions were rated

less highly in variety, relevance, and the two activity scales.

On the basis of information from the two teacher interviews, all teachers who had originally indicated a favourable attitude towards the teleconference system maintained this attitude. The one teacher who entered the trial with a negative attitude towards the teleconference system retained this attitude and was joined by one other teacher who did not complete the first Telecom survey. The distinction should be drawn between their level of satisfaction with the teleconference system as a means of communication and their ease with it and its use in this particular pilot project. During interview, many of the teachers dwelt at length with the difficulties brought about by the lack of planning and shortage of preparation time.

TABLE 7
Teacher Feelings Towards the Discussions

	Frequency					
	Extremely	Somewhat	Neutral	Somewhat	Extremely	
Q. 11. Boring(1)	-	1	1	8	7	Interesting(5)
Q. 12. Probing(5)	2	5	3	5	-	Superficial(1)
Q. 13. Relaxed(5)	5	7	1	2	-	Tense(1)
Q. 14. Dissatisfying(1)	1	-	3	4	7	Satisfying(5)
Q. 15. Dynamic(5)	2	6	2	5	-	Static(1)
Q. 16. Competitiveness(1)	-	-	4	7	4	Co-operative(5)
Q. 17. Useless(1)	-	1	1	5	8	Useful(5)
Q. 18. Varied(5)	4	2	6	2	1	Repetitive(1)
Q. 19. Productive(5)	-	7	6	2	-	Counter-productive(1)
Q. 20. Lively(5)	4	6	3	2	-	Dragging(1)
Q. 21. Aimless(1)	-	-	3	4	8	Directed(5)
Q. 22. Bad(1)	-	1	1	6	7	Good(5)

6.3 Student attitudes towards the teleconference system.

Table 8 summarises thirty-two student responses to fourteen statements designed to indicate student attitudes towards learning with this technology. While three students indicated that they had diffiulty in answering some of the questions, seventy eight questionnaires were completed and this probably ensures that a valid indication is received of the student attitude from this data. As in Table 6, the mean and frequency distribution for each of the statements is shown. Students indicated a positive attitude on all fourteen statements. When the mean ratings were compared for telephone-based instruction sessions and telelecture sessions, students using the teleconference system in the telephone-based instruction mode were slightly more confused; they found it more difficult to get used to the system,had more difficulty knowing whether the people at the other end were listening, and would have been more comfortable if all the participants were in the one room. however, the differences were not very great.

TABLE 8
Student Attitudes Towards the Teleconferencing System

	Mean	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
		5	4	3	2	1
Q. 2. I think we were confused about what we were supposed to be doing in the conference.	1.8	1	6	4	35	30
Q. 3. I felt that people talked past each other quite a bit.	2.0	1	5	15	31	26
Q. 4. I found it disturbing not being in the same room with some of the other people.	2.0	1	4	4	53	14
Q. 5. I quite often felt that my own comments were not directed to any specific person and this bothered me.	2.3	1	2	24	31	19
Q. 6. At our end, we sometimes talked things over amongst ourselves before we said anything to the others.	3.2	5	37	5	22	7
Q. 7. It was hard to know who was talking at the other end.	2.2	3	9	5	40	20
Q. 8. Getting used to this system is quite an effort.	2.0	-	9	5	41	24
Q. 9. I was sometimes uncertain whether the people at the other end were listening.	2.6	3	9	15	37	13
Q. 10. When someone at the other end spoke, it was always clear to whom he or she was speaking.	3.5	8	38	17	12	3
Q. 11. I think that if we had all been together in the same room, the discussion would have been more productive.	2.7	4	11	24	29	7
Q. 12. I had quite a bit of trouble knowing how the people at the other end were reacting to the things I said.	2.9	6	12	36	18	5
Q. 13. When those at the other end were speaking, I got the feeling they were speaking directly to me.	2.9	-	30	18	23	6
Q. 14. I think that if we had all been in one room, I would have felt more comfortable.	2.4	3	7	19	38	11
Q. 15. It was sometimes hard to react to things said at the other end because it was hard to interpret what was said.	2.6	3	14	16	36	8

Table 9 summarises their feelings towards various aspects of each session. Once again, student responses were favourable towards the system. The majority of students perceived the sessions to be co-operative rather than competitive.

Table 9 summarises their ratings of six scales describing aspects of each session. The means for each scale are summarised below:

Activity	Lively/dragging	3.7
Receptivity	Relaxed/tense	3.6
	Boring/interesting	4.0
Variety	Varied/repetitive	4.0
Relevance	Probing/superficial	3.6
Co-operativeness	Competitive/co-operativeness	3.9

In summary, students found the sessions to be interesting, co-operative, and varied in their content. They also considered the sessions to be co-operative rather than competitive.

TABLE 9

Student Feelings Towards the Discussions

	Frequency					
	Extremely	Somewhat	Neutral	Somewhat	Extremely	
Q. 19. Boring(1)	1	5	11	35	27	Interesting(5)
Q. 20. Probing(5)	8	39	23	5	1	Superficial(1)
Q. 21. Relaxed(5)	13	37	17	8	2	Tense(1)
Q. 22. Varied(5)	17	40	16	2	-	Repetitive(1)
Q. 23. Lively(5)	17	27	26	7	1	Dragging(1)
Q. 24. Competitive(1)	2	4	23	26	25	Co-operative(5)

Chapter 7 Educational Implications of the Teleconference system.

7.1 The Impact of the system on the level of student achievement.

Since it was not possible to pre-test and post-test the students on clearly defined subject matter, and compare the results with a control group, other indicators of levels of student achievement were sought. Both teachers and students indicated in their responses to statements on their questionnaires whether the students had improved their understanding and they were also questioned about this during interviews.

7.1.1 Student questionnaire responses.

After some sessions using the system, students were asked to indicate their level of agreement with statements 16, 17 and 18 from the student questionnaire. (Appendix D)

TABLE 10
Student Assessment of the Impact of the Teleconference System on Their Understanding of Topics

	Mean	Strongly agree 5	Agree 4	Don't know 3	Disagree 2	Strongly disagree 1
Q. 16. The group discussion I was involved in helped me to understand my work.	3.8	8	51	17	2	-
Q. 17. I consider that the social contact with other teachers and students was valuable.	4.1	19	49	7	2	-
Q. 18. The system helped me gain an understanding of difficult ideas much quicker than I would have from written notes.	3.5	5	39	27	5	1

Students agreed with all three statements although the level of agreement was slightly higher from the Birchip and Wycheproof students who were using the telelecture mode rather than the St Arnaud students who were using the system in the teleconference mode. Table 11 provides asummary of student assessment of the teleconferencing system relative to other forms of learning. The teleconferencing system was rated favourable relative to face-to-face teaching, face-to-face group student work and correspondence course learning.

TABLE 11
Student Assessment of the Effectiveness of Teleconferencing Relative to Other Forms of Learning

	Mean	5 Extremely effective	4 Relatively effective	3 Of some value	2 Relatively inaffective	1 Extremely inaffective	0 Not Applicable
Q.25. How effective is teleconferencing relative to face-to-face teaching?	3.6	7	36	34	-	-	1
Q.26. How effective is the teleconferencing system relative to face-to-face group student work?	3.5	6	37	33	1	-	-
Q.27. How effective is the teleconferencing system relative to correspondence course learning from printed notes ?	3.9	24	22	28	-	-	2

7.1.2 Student interview responses.

In order to obtain more detailed information on this question, all students who had used the system were interviewed during the period July 12th-15th. The Wedderburn students felt that normal classes would have been more beneficial but only because they were still inexperienced with the teleconference system. They felt that once they got to know the students in the other schools, there would be more direct student to student conversation. At this stage, most of the student input was at the instigation of their teachers and was not spontaneous. It was also pointed out that even though they may not be talking over the system, they were usually taking notes. The St Arnaud students felt that their sessions on the system have been helpful in terms of giving them contact with different points of view and broader terms of reference. They also felt that the system was useful in that it gave them an indication of the standards that students in other schools were achieving. Charlton High School students had used the teleconference system in both formats and felt that they had acquired new knowledge and gained some insights in how to discuss and present it.

Most of the material had been covered in their classes but the session had given them a greater depth of treatment. They also felt that they had gained in confidence. This was particularly relevant in a telelecture with one of the Australian History examiners. The examiner pointed out some of the mistakes candidates had made in previous papers and students found this helpful.

The students of Wycheproof and Birchip High Schools who had used the system in the telelecture mode appreciated having more current information from the people they spoke to. Generally they were uncertain at this point whether they had gained in confidence or in examination technique. The McAuley Charlton students who were interviewed were uncertain about any impact on their examination technique. They believed that the value of student achievement from the system depended on what individuals

were prepared to put into it.

The interpretation of student responses is difficult because there was some interaction between the novelty of taking part in the pilot project and their attitudes towards the teleconference system. However, as a group, they believed that they were gaining valuable information through the system.

7.1.3 Teacher questionnaire responses.

Teachers completed questionnaires after their sessions using the teleconference system and they all indicated that their students had improved their understanding of the subject matter. However, they tended to be responses from the teachers who had conveyed the most enthusiasm towards the teleconference system during their interviews.

7.1.4 Teacher interview responses.

Fifteen of the seventeen teachers using the teleconference system were interviewed in the period July 12th to July 15th. Ten of the teachers agreed that the teleconference system was giving their students opportunities to enhance their understanding of their subjects. Two felt that they had not used the teleconference system sufficiently to decide and three clearly indicated that the teleconference system was not contributing to their students' understanding of their subjects. One teacher indicated that the sessions were less satisfactory than normal lessons because students were less likely to contribute to discussion. One other teacher indicated that the discussion was superficial and inclined to reach the 'lowest common denominator'. It was significant that the three teachers who felt that the teleconference system was not contributing to their students learning were all using it in the telephone-based instruction mode. Eileen Smith felt that her students were now using vocabulary and phrases which they had acquired from their contact with external speakers through the system and Dave Kruger suggested that his students were now organising their thoughts better and were being forced to put their thoughts into

conversation.

During the second sequence of interviews from August 10th to August 12th, fifteen teachers were asked about the system's contribution to their students' education. Thirteen felt that it had made a positive contribution. Robert Gray felt that a good one day seminar would have as much or more impact and Helen Price suggested that 'we might be looking at a level of education that might be a bit beyond H.S.C and more into university standards'. Both believed that their students 'wanted more teacher-directed face-to-face instruction which picks up their individual needs and problems'. The response of these two teachers was in part due to factors such as the poor room where the terminal was used, the unreliability of their terminal and organisational problems such as negotiating room changes and arranging for students to be free for teleconference sessions.

7.2 Impact of the teleconference system on the classsroom management of instruction.

Unlike most classroom technology such as video cassette recorders which tend to re-inforce the existing role of teachers in the classroom, the teleconference system has the potential to at least partly re-define his role. The work of the teacher is taken beyond the classroom and placed before a group of unknown students and teachers. Procedures taken for granted in the classroom are denied and the valuable visual feedback which teachers rely upon is missing. Because of this, it seemed pertinent to examine what impact the teachers thought the teleconference system was having on a number of their teaching functions. This was sought from teachers during the first series of interviews. Five classroom functions were considered. They are advising, steering, socialising, confering and overseeing. Fifteen teachers were interviewed in regard to these classroom functions. Each function is discussed separately.

7.2.1 Advising.

In relation to their function as advisors, ten of the fourteen teachers who considered this aspect felt that they could emerge as warm approachable individuals using this system. Several anticipated that it may take longer than the five weeks they have been using the system. The Art teachers also stressed the value of the H.S.C. residential camp held at Boort during the Queens Birthday weekend. On this weekend, teachers and students were able to meet and consequently they could recognise each other's voices on the system. In terms of relaxation, thirteen of the teachers indicated they had achieved a relaxed atmosphere using the system or that they could achieve it in time. One teacher indicated that he thought lessons were more formal when the system was being used than a normal face-to-face class lesson. One difficulty was the presence of two other teachers and he found that he was constantly thinking of how they would react to what he was saying. There was the added problem of how much to say on the system. The balance between teachers providing information and students seeking information seemed difficult to achieve. One teacher also indicated that her students had some reluctance to participate in case they made fools of themselves. The microphone mute switch was used frequently during the teleteaching mode by students so that they could discuss their responses to a question with their teachers without the participants in other locations hearing them.

7.2.2 Steering

Teachers were asked several questions in relation to the function of steering or guiding their students during the process of learning. In terms of catering for individual needs, all teachers felt that this was impossible or extremely difficult to achieve using this technology. Generally the system is biased towards group use. Most of the teachers felt that it was possible to motivate students using the system but all groups would require common visual illustrations in subjects such as Art and Australian History or the topic has to be very interesting.

In addition, one teacher needs to have individual control of the session. There was much less agreement amongst teachers on how easy it was to evoke individual participation from students. While one teacher said it was easy, most were uncertain or felt that it could be very difficult. One of the problems of using the system is that it is very easy to forget quiet participants in other locations.

Since the teleconference system is essentially a group-oriented activity, most teachers felt that it did not encourage independence amongst their students. One teacher felt that it made the students more dependent on the teacher since in the telephone-based instruction mode, students would refer to the teacher prior to answering a question or making a comment. This could be expected to breakdown to some extent over time when students began to know each other better and recognise each other's voices. Most teachers also felt that the system did not make it easy to vary presentation during a session.

They were almost evenly divided on whether the teleconference system was inducing co-operation or competition amongst their students. Most of the teachers who used it for telelecture felt that it promoted co-operation amongst students. When the system was used in this way, it was possible for students to undertake individual research and prepare their own questions to ask the speaker. However, when it was used in the telephone-based instruction mode, it was essentially a group activity. They also indicated that it reduced the amount of flexibility they normally have to vary rapidly content or learning strategies in a classroom.

In relation to using the system for a variety of teaching techniques, the English Literature group had been using it for problem solving but other teaching techniques had not been tried. Teachers agreed that the system had some potential for brainstorming but the inability to use visuals was one of the main constraints of the system.

In terms of the socialising role, the consensus amongst teachers was that this would be difficult. and this also applies to the conferring function.

7.2.3 Socialising, and conferring with and overseeing student activity.

7.2.4 Overseeing students.

Most of the functions related to overseeing students were also considered extremely difficult. These included diagnosis of individual difficulties, awareness of individual student behaviour, awareness of the causes of individual student behaviour and grading and evaluating students. It was only in the last function that teachers felt they could partly do this. One of the aims of an elective for the Australian History course was for students to develop an empathy with Aboriginal problems and the type of questions they framed for the external speakers indicated in part whether they had achieved this. It was also possible to pick up their perceptiveness from the type of questions they were asking. However one of the dangers raised by Mike Smith was that teachers may be grading confidence rather than ability.

7.3 Curriculum Development.

The teleconference system has the potential to have a big impact on the way courses are organised. Obviously, there would be pressure to standardise content and resources such as text books. Several teachers indicated that this would be strongly resisted in the subject areas used in this pilot project. In terms of getting resources for curriculum, all teachers agreed that this was the main contribution of the teleconference system to education. This system has a profound impact on long range planning. The requirements for this are treated at length in the conclusions and recommendations.

7.4 Impact of the teleconference system on Teaching Style.

Finally teachers were asked if it was difficult to achieve the correct 'instructional fit' using the teleconference system and did they have to make significant modifications to their teaching styles to incorporate it. All the teachers who spoke about this indicated that it was not a problem and only one suggested that he might have modified his teaching slightly because of the presence of other teachers on the system. Kath Rawlings indicated that she found it positively re-inforcing to have another teacher 'present'. Several teachers also indicated that the novelty of the pilot project helped them to adjust to the teleconferencing system.

7.5 Impact of the teleconference system on the External Participants.

The reaction of external participants to the teleconference system has varied according to their experience with this type of technology or similar types of technology. Without exception, the political speakers adapted very easily and several of them exceeded the time limit they originally allocated to speak to the students. Appendix F contains letters from Senator Missen and The Right Honourable Doug Anthony to Greg McIntosh summarising their reactions to using the teleconference system with the Politics class of Wycheproof Education Centre. Other speakers such as practising teachers were concerned with some aspects of the teleconference system. Bob Lewis and Elsie Anderson (two Australian History examiners and teachers) were both interviewed to determine their reactions. Bob Lewis had documented his criticisms in a letter to Brendan Monks. (Appendix G) Unfortunately, his session on the teleconference bridge suffered from some difficulties which were school-based in origin. One class had to leave the session early and their teacher without warning 'hung up' and 'blew the bridge up'. Lewis had to wait until he was reconnected to the bridge and since he had teaching commitments next period in his own school, he was concerned about time delays. Elsie Anderson went to the Telecom Research

Laboraratory to give her talk. Here, she was shown photographs of the terminals in the schools and how to use the equipment.

Secondly, Lewis commented on the lack of feedback from students. Because of noise on trunk lines, teachers have occasionally had to switch off their microphones to quieten the link and and in doing this, they effectively prevented any feedback to the lecturer. The lack of feedback with the Lewis lecture was compounded by the fact that one class had not yet studied the topic of his lecture and they were unable to make any input to it. Elsie Anderson indicated that it was difficult to know how much the students knew or how much she was helping them. The students hardly ever asked questions and their answers were brief. She sought to overcome this by interspersing her talk with questions to the students. This had a disturbing effect on them because they had no warning of the pending question. She indicated that she would have appreciated more guidance from the teacher present at each school. Both examiners sent materials to the schools and referred to them during their lectures.

Elsie Anderson also felt that one hour or more was probably too long for a lecture particularly when the quality of the sound is not satisfactory. In general her session on the system was not as accident prone as Bob Lewis's session and she was more positive in her attitude towards the system. She felt that it would have application in suburban schools particularly towards the end of the year when students are revising their work. She also indicated that she had organised a number of seminars with neighbouring schools and she commented on how disruptive and costly it was to shift students between schools. Often with the wide range of electives being taught in Australian History, neighbouring schools did not study the same topics and students had to travel some distance. Both examiners raised a number of issues which will be dealt with more fully in the recommendations. The technical quality of the equipment had a considerable impact on what was accomplished using it and this is discussed in Chapter 8.

Chapter 8 Technical Aspects of the Teleconference System.

The technical quality of equipment in schools is critical to the effective teaching of students. Most teachers are not competent in maintaining electronic equipment and they usually do not have time during the day to make running repairs to faulty equipment. They become disillusioned rapidly when they see potentially rewarding learning sequences destroyed by unreliable equipment. The teachers in the Charlton pilot project were critical of the reliability of the equipment and some aspects of its design and construction.

8.1 The remote terminal.

8.1.1 Dialling procedure.

Because of his experience with computers and similar equipment, Mark Kelly was able to make a number of suggestions in relation to the design of the terminal. He suggested that the dialling procedure could be simplified if the codes and phone numbers of the other schools were stored in an EPROM (erasable programmable read-only memory) That is, instead of having to press a long sequence of numbers, each school could be contacted by pressing one digit.

8.1.2 The stem of the central microphone.

Parts of the stem have become detached on several occasions in a number of schools. Because the microphone has to be disconnected at the end of each session, it will need to be strengthened to withstand this operation.

8.1.3 Headphones

Students and teachers in at least two schools have indicated that they have had difficulty with the headphones slipping from position during a long session.

8.1.4 Terminal Buttons

The terminal buttons are more difficult to operate than necessary. They have a long travel distance and the springs are very strong. Mark Kelly suggested that a keyboard with an audible click similar to a calculator keyboard might help to overcome some of the dialling difficulties.

8.1.5 Individual Microphones and Extraneous Noise.

Individual wireless microphones such as FM microphones connected to headsets that are grouped and transmitted by a small FM receiver in the terminal might be more effective and might also cut out some of the extraneous noise which has been picked up.

8.1.6 Elimination of standard handset.

Some consideration should be given to incorporating a speaker in the equipment for connecting schools to the bridge to eliminate the standard handset.

8.1.7 The Manual.

The manual that was supplied by Telecom was clear and teachers were able to follow the dialling procedure. However it appears that there may still be some confusion about when an operator can switch from handset to group.

8.1.8 Other observations

One teacher has indicated that she found the case was too small. Unless the headphones were packed away very neatly, the case would not close. This was a time consuming activity at the end of the session. It highlighted the difficulties faced by teachers using this equipment in the classroom situation relative to business executives using it in an office.One teacher indicated that a longer lead to the telephone socket would have been useful.

8.2 The Teleconference Bridge.

8.2.1 Dialling up procedure and the response time of the bridge.

The dialling up time to connect all schools has varied from ten to twenty minutes. It was influenced by the number of schools to be connected and partly by operator skill and experience. An EPROM facility would shorten this time. Also the response time after disconnecting a school from the bridge varied from five to ten seconds. This was disconcerting when a speaker was interrupted in mid-sentence and it was confusing when a teacher-operator was disconnecting two schools. The operator sometimes became confused as to who he still had on the bridge.

8.2.2 The quality of the trunk lines.

Because all the calls from the schools were transferred by trunk line to the bridge in Melbourne and back again, the quality of the lines was critical to the use of the system. Generally they were poor. On occasions, there was a variety of extraneous noise on the lines and teachers were forced to suspend the bridge connection and dial again to try and improve the quality of the sound. Where teacher-operators were unfamiliar with the dialling procedure, they were reluctant to take this step.

A more disturbing aspect of the trunk lines was the phenomenon of 'dropping out'. Isolated words sometimes disappeared from the conversation, whole passages or, on occasions, the whole bridge has 'crashed'. This problem was particularly evident when the English Literature group attempted to use the bridge one morning when the trunk lines were at their busiest. Professor Bradley of Monash University was only available in the morning and he was connected to three schools. The session was virtually useless to the students because of the poor quality of the sound. Obviously, any type of disruption was disturbing to teachers and students unfamiliar with the equipment. Bad sound using the bridge was mainly due to the quality of the trunk lines but there may have been an element of operator fault as well. Graham Willis of Charlton High School

indicated that when he was demonstrating the equipment to the Mothers Club, he accidently dialled the school number without using the STD code. A loud static came through the system and this type of operator fault may have contributed to some of the problems with sound during the life of the pilot project.

8.2.3 One teacher suggested that there should be some way of knowing if the bridge was working. On one occasion, the convenor 'dropped off' the bridge and participants were unable to tell him that he wasn't connected to them.

Obviously, many of these observations were attributable to the fact that the system was a prototype and work was still being undertaken on its design and construction a short time before it was due tobe installed in the schools. The placement of a teleconference bridge in Charlton would probably overcome the difficulty of noisy lines for most schools.

8.3 Telecom Technical Support.

The technical support services provided to the schools by local Telecom staff was excellent.

8.4 Location of the Terminals within Schools.

The central microphone of the terminal was very sensitive to extraneous noise and the suitability of the rooms in which the equipment was operated varied from school to school. Probably the most favorable location was St Arnaud High School where it was operated in a uncarpeted room adjacent to the library. The worst location was at Wycheproof and Wedderburn schools where it was operated in rooms close to corridors and where there were noisy classrooms nearby. Obviously, the terminal needs to be operated in a reasonably sound proof room which is carpeted. It also requires a central table around which at least six people can write whiie they are taking part in the sessions. In several of the schools, the system was placed in locations which were used for other activities. This has caused some disruption to

school activities and to teachers. Generally, the room conditions within the schools were not adequate and if this teleconference system is to be introduced into schools, consideration must be given to providing a suitable location for it.

Chapter 9. Economic aspects of the teleconference system.

The costs given in this analysis are estimated and cannot be taken as firm quotations. However, they do provide some indication of the approximate cost of the teleconferencing system used in the Charlton pilot project.

9.1 Approximate establishment costs if the equipment is hired.

The following establishment costs are based on providing eight small group terminals and access to a manual teleconference bridge for eight schools.

TABLE 12.
Approximate Establishment Costs if the Equipment is Hired.

	$	$
Administrative/planning		
Salaries	2800	
Telephone, postage	2500	5300
Room conditioning costs		16000
Provision of lines	1200	
Annual rent of lines	840	2040
Equipment costs.		
Small group terminals		
- Rent(8 X $450)	3600	
Headsets		
- Rent(64 X $34)	2176	
Manual bridge		
Rent	9000	14776

Total		38116

Explanation of costs

1. The salary and supplements are for a co-ordinator for one

month and the Telephone, postage and travelling costs are associated with co-ordinating school timetables and arranging external speakers.

ii. Room conditioning costs.

Because of the wide variation in the sound qualities and the design of classrooms found in Victorian schools, it is difficult to estimate the average cost of renovating rooms to make them suitable for the teleconference system.

Costs in this trial would have varied from negligable for St Arnaud to probably $5000+ for Wedderburn, Birchip and Wycheproof. Therefore an average amount of $2000 per school has been used.

iii. Installation and rental of equipment.

No price is available either for the rent or outright purchase of an automatic bridge. The hire charge would be based on the time that the equipment was used. The Telespec manual bridge has been used for this analysis.

9.2 Approximate Establishment Costs if the Equipment is Purchased Outright.

TABLE 13

Approximate Establishment Costs if the Equipment is Purchased Outright

	$
Administrative	5300
Room conditioning costs	16000
Provision and rent of lines	2040
Equipment	
Small group terminals (8 X $1250)	10000
Headsets (64 X $95)	6080
Manual Telespec Bridge	24000

Total	63420

9.3 Annual recurrent cost if the equipment is hired.
These costs are based on a full calendar year.

TABLE 14

Recurrent Cost of the Teleconference System if the Equipment is Hired.

	$
Organisation-salary, postage etc.	3000
Rent of line	840
Rent of small group terminals	3600
Rent of headsets	2176
Rent of manual bridge	9000
Telephone calls	?
Total	18616

Explanation of costs.
No attempt has been made to estimate the cost of telephone calls. When teachers in the pilot project were questioned about the extent that this system would be used in a small secondary school, responses varied from three one hour telelectures per subject per year to 15 hours per week per school. In addition, costs would vary considerably depending on the way in which the system was used. Telephone-based instruction where schools were linked together for the cost of a local telephone call would be the most inexpensive use while telelectures linking an external source would be the most expensive.

9.4 Annual recurrent costs per annum if the equipment is purchased.

TABLE 15

Recurrent Costs per Annum if the Equipment is Purchased

	$
Organisational-salary, postage etc.	3000
Rent of line	840
Depreciation of terminals (20%)	2000
Maintenance of terminals (10%)	1000
Depreciation of headsets (20%)	1216
Maintenance of headsets (10%)	608
Depreciation of manual bridge (20%)	4800
Maintenance of bridge (10%)	2400
Telephone calls	?
Total	15864

9.5 Offsetting costs

It is unlikely that teleconferencing will replace any existing costs of postage and telephone. Albertsen in her review of the literature related to teleconferencing as a subsititute for travel concluded that teleconference facilities are likely to result in more communication. (Abertson, 1977)

9.6 Cost of telephone calls

The following rates are levied for trunk telephone calls:

Time allowed for 13 cents

Monday-Saturday 8 am-6 pm

Less than 50 km	90 sec.
50-85 km	45 sec
85-165 km	20 sec

165-325 km	12 sec
325-645 km	9 sec
645-1145 km	7.5 sec
More than 1145 km	6 sec

(Telecom, 1982)

At the above rates, a forty minute telelecture linking Sydney would cost $41.60.
Added to this would be a number of ordinary calls to Sydney to arrange the telelecture. Therefore, the final cost of the telelecture might be aproximately $50.

9.7 Willingness of the schools to pay for the teleconference system.

School Principals were interviewed about the willingness of their schools to pay for this technology. All Principals indicated that they would be willing to pay approximately $250-$400 each year with the exception of McAuley Coolege which would be prepared to pay $1,000 per year. Peter Milward, Principal of Charlton High School indicated that he only had approximately $1,500 of discretionary funds per year and John Rawlings, Principal of Boort High School suggested that he could allocate approximately $250 but would not know what other expenditure he would have to curtail to pay for the system. A further point raised by some teachers and Principals was the fact that this teleconference system would be mainly for the benefit of a small number of senior students. If it became expensive, it would be difficult to justify this level of expenditure on such a small number of students.

9.8 Conclusion.

The establishment costs of approximately $63,000 and recurrent costs of approximately $16,000 per annum if the equipment is purchased outright are beyond the financial resources of a group of eight small schools. Also, these costs

have been calculated without taking into account a social discount rate. One alternative might be for communities such as the Kara Kara region to consider financing a teleconference system either by forming a users' group or in conjunction with local government. This would then make the system available to users such as other government departments, local social groups such as sports clubs and private industry. A further alternative for schools might be the purchase of loudspeaking telephones for approximately $300.At an annual depreciation of 20% and maintenance costs of 10%, the annual equipment recurrent costs would be $720 for the eight schools. This is a much lower cost than providing small group terminals and the manual bridge and this system enables group-to-one communication. However, it does not allow the multi-school links which would spread the costs of trunk calls or allow for interschool meetings.

Chapter 10 Conclusions and Recommendations.

10.1 Conclusions.

10.1.1 Frequency and type of use of the system

During the twelve weeks of the pilot project, the schools used the teleconferencing system on 123 occasions. Twenty-eight of these have been multiple school using the teleconference bridge while ninety-five have been single school or dual school use without the automatic teleconference bridge. The largest number of contacts were made for arranging telelectures and a small number of meetings between school Principals and members of the Kara Kara computer sub-committee. There were nineteen telelectures and fifteen telephone-based instruction sessions. (Table 4, Sections 4.1-4.3, pp.25) Wycheproof and Birchip High Schools were the largest single school users of the system.

10.1.2 Impact of the teleconferencing system on increasing interaction between the schools.

The biggest impact of the system was to provide the schools with access to various types of external expertise. This has varied from topical information related to political concepts relevant to the H.S.C. Politics and Australian History courses to valuable advice from H.S.C. examiners. (Section 5.1.3 pp. 31) There was also the secondary consequence of a flow of printed information to the schools.

As well as contributing to a flow of information from external sources, the system contributed to an exchange of information about resources amongst the seventeen teachers using the system. In this way, the system made a contribution towards the informal inservice education of some of the teachers in the schools. While the system was not used extensively for meetings,

the school Principals believe that it has potential for this use. The effectiveness of these meetings is in part dependent on the subject matter of the meetings. The pilot project has not improved the access of students taking a subject by correspondence to further educational resources. The small number of these students in the schools and the lack of planning time has meant that their needs have been overlooked.

A number of themes have emerged from interviews with teachers and students. The first is that parents in these towns want their children to be able to complete their education at a secondary school in their town. The second is that the students themselves prefer to study with a teacher rather than undertake a course by correspondence. Thirdly, when twenty-two of the students were asked if there were any other H.S.C subjects they would rather be studying if they had the choice, only five students suggested that they would like to study some of the Group B. subjects. Obviously further study needs to be undertaken to consider the possibilities opened up by the teleconference system. To borrow a concept from economics, the technology can be used for curriculum deepening by providing more resources for an existing curriculum, or for curriculum widening by providing students with a wider choice of subjects.

10.1.3 Impact of the system on saving money and time.

When used in the telelecture mode, it saved both time and money but this appears to have been achieved at the expense of the individual teachers who have made the arrangements.

10.1.4 Impact of the teleconference system on the academic achievement of students.

All the teachers and students indicated that the teleconference system either had or had the potential to improve the academic achievement of country students.

Tables 10, 11. Section 7.1, pps

They believed that they had received more ideas and interpretations from other sources and these were beneficial. However, the shortness of the trial makes it unlikely that there would be any discernible change in their achievement at the end of the year. When students were questioned about any change to their level of confidence or to their techniques in answering examination questions, they were generally non-committal. The only exception were some of the Wycheproof students who felt that they were now more confident in discussing political concepts. The students were as a group, equally uncertain about whether the more academically able would gain more from using this technology than the less academic students.

10.1.5 The impact of the teleconference system on instruction.

This teleconference system had considerable impact on teaching strategies since all the visual cues are denied to a teacher. On the basis of its limited use in this pilot project, instruction in Art proved to be difficult because of its large visual component. Research with adult learners suggests that the technology is more useful for discussion situations. (Becker, p. 123) However, the experience of the three teachers who have used it for English Literature suggests that these discussions need to be very structured and planned if they are not to degenerate into a discussion of irrelevant issues.

As well as being subject specific, the teleconference system is probably teacher specific. One teacher in the pilot project indicated that she was reluctant to use the teleconference system because of her uncertainty about its operation. Prior to the commencement of the project, one Principal indicated that in his opinion, the more competent teachers would use the teleconference system more effectively. No attempt was made to relate the use of the system to the ability of individual teachers. Some teachers in the pilot project were prepared to make more use of the teleconference system and this is partly a reflection of their professional expertise, the suitability of their subjects

and the mode in which they were using the teleconference system. The teachers were also divided over the most suitable time during the year to use the teleconference system. Some felt that it would be most useful for revision in Term 3 while others saw its main value in Terms 1 and 2 as an information source. (Sections 7.2-7.5 pp. 52)

10.1.6 The technical quality of the teleconference system

While some serious problems emerged with the teleconference system to disrupt instruction, none of them appear insurmountable.A number of observations have been outlined in Chapter 8. (Sections 8.1-8.4, pp. 59)

10.2 Advantages and disadvantages of this teleconference system for education.

This teleconference system offers a number of advantages over other types of technology used education systems. Firstly, the teleconference system requires no expensive software to keep it functioning and it can be installed relatively quickly and subject to the schools having planned for its use, it can be operating fairly quickly after being installed. Secondly, it is backed by a nationwide service system with technicians relatively accessible to most schools within Victoria. Thirdly, the teleconference system enables students to take an active part in operating it. They are not simply passive participants. Fourthly, this technology provides schools with access to any individual or organization that can be contacted by telephone. Finally, it can be relatively simple to operate. While there are a number of skills that have to be acquired, users do not need a detailed knowledge of the technical aspects of the system.

However, as with most technology, there are some disadvantages for schools. Firstly, there is the financial burden of recurrent costs. These would be prohibitive if the system was used as it was in the pilot project. Secondly, it requires detailed planning and administration and it places an

emphasis on close co-operation between schools. Victorian schools have developed on a neighborhood pattern and tend to be self-contained and inward-looking. Many co-operate to varying degrees with neighbouring schools and there are some examples of closer co-operation. Pettit (1980) has examined aspects of the Brunswick Secondary Education Council (BRUSEC),and the Doveton and Mid-West groups and concludes that from the outside they look solid, but from within, they are only tenuously held together by goodwill. While this does not preclude the successful use of this teleconference system in Victorian schools, it means that the underlying social attitudes and structures while not hostile to the teleconference system, may not be conducive to its introduction. A third disadvantage is the potential of this teleconference system to standardise curriculum content such as the topics studied and the materials used to convey the information to the students. Fourthly, the remote terminal is sensitive to extraneous noise and requires a location which is reasonably sound proof. Some schools are fortunate in that they have a suitable location but other schools could be faced with considerable expenditure to convert a room for the terminal. Finally, there is a shortage of people in Australia who have experience in using this teleconferencing technology in education.

The pilot project proved worthwhile in highlighting a number of problems which can occur with teleconference systems if they are used in schools in certain circumstances. The following recommendations have been made as a result of that experience.

10.3 Recommendations.

10.3.1 Recommendations relating to planning and implementation.

Recommendation 1. It is recommended that at least six months before the teleconference system is due to be installed in schools, planning should be commenced, and a full-time

co-ordinator be employed for at least one month.

There are a number of issues which have to be resolved before a teleconference system can be successfully implemented in a group of schools. Firstly, schools need to standardise the starting and finishing times of at least two periods each day and the finishing time of each school day. Secondly, it is essential that the subject areas which choose to use the teleconference system have at least one period per week timetabled at the same time throughout the group. Thirdly, it is important for the co-ordinator to assist schools to identify their areas of greatest need and to ensure that the teleconference system is used to its fullest capacity to meet these needs.

Recommendation 2. It is recommended that teachers should be given a time allowance to compensate for the additional preparation which is necessary to use this teleconference system.

The system can be used in a mode which is similar to team teaching in a standard classroom situation. However because of the dispersal of the classes, it is much more time consuming for teachers to co-ordinate their activities and to distribute materials to students in various schools.

Recommendation 3. It is recommended that a teacher from within the school group be given a time allowance and/or financial remuneration to undertake to following functions on a permanent basis:

(a). to draw up a timetable for the use of the teleconferencing system.

(b) to organise a booking service for the system.

(c) to undertake responsibility for all correspondence students in the group in relation to their use of the teleconference system.

(d) to provide a reference point to which teachers could refer if they felt that all schools could take advantage of some unforeseen benefit such as a visiting speaker to one school.
(e) to produce and distribute a brief newsletter outlining what is happening in each school and any circumstances such as examination dates which may disrupt the use of the teleconference system.
(f) in conjunction with the teachers who wish to use the system, to identify the external participants to be contacted and arrange for them to receive some in-service prior to being contacted.
(g) to undertake some inservice education and continual updating of information thought relevant to the users of the system.
(h) to develop a strategy amongst the users for initiating the bridge to ensure that it is implemented even though a co-ordinator may be absent from his school on a particular day.

10.3.2 Methodological.

Recommendation 4. It is recommended that all potential users be given adequate inservice education prior to using this teleconference system. Inservice education is critical to the use of this technology. Monson et al (1977) has provided many useful techniques which are relevant to using the system and the Centre for Interactive Programs, University of Wisconsin, Madison has published a number of materials on teleconferencing techniques.

One further finding from the pilot project was the importance of providing some guidance to potential external contacts. This might simply be a description of the techniques which the teachers have found to be effective when using the system. Emphasis should also be placed on the variety of feedback that can be given by the teachers to these external contacts to create the 'word pictures' so necessary.

10.3.3 Technical recommendations.

Recommendation 5. It is recommended that Telecom give consideration to implementing the improvements in the remote terminal outlined in Chapter Eight.

Students particularly were concerned that they were spending up to twenty minutes at the beginning of periods waiting to be linked in to the other schools.

Recommendation 6. It is recommended that Telecom give consideration to installing automatic teleconference bridges in cntral district locations to improve the quality of sound in the systems.

In relation to the quality of the telephone trunk lines, if an automatic telconference bridge were placed in a central town in the district, the volume of the sound would be improved and the annoying 'dropping out' which was so common during the pilot project when the schools were using the system in the telphone-based instruction mode would be reduced. It is also essential that all the schools in the group are linked to the automatic teleconference bridge by a local call rate rather than a trunk call rate. This would make use of the system for meetings more economical for schools and encourage use of the system.

Recommendation 7. It is recommended that before a teleconference system is installed in schools on a permanent basis, adequate room be provided to house the remote terminal.

This is critical in relation to the level of extraneous noise which is picked up by the central microphone. The terminal should be installed in a room away from the main traffic thoroughfares in the building and attention should be paid to the sound reverberation qualities of the room. This may mean carpeting it, treating the walls with sound absorbing material

and hanging heavy curtains over the windows. If the device is to be installed permanently, then it would be an advantage to house it in a special room other than a classroom in order to reduce the disruption to other staff and students.

This teleconference system even with the considerable constraints of the pilot project has shown that it can make a positive contribution to the education of H.S.C. students in country high schools. While these students, because of their small classes, have more access to their teachers, a teacher is only one resource for students studying H.S.C.. Metropolitan students are more likely to find the extra curricular activities which are compatible and supportive of their study. Country students are denied the ongoing cultural milieu which many city students find so rewarding and stimulating. This technology can partly redress some of this disadvantage by providing country students with verbal contact with other students and external authorities.

REFERENCES

Albertson, L. R and Bearlin K. S. Telelink: a case study. Research Laboratories Report 7241. Australian Telecommunications Commission. Melbourne, 1977. ED 192 817.

Albertson, Lesley A. 'Telecommunications as a travel substitute: some psychologial, organizational and social aspects'. Journal of Communications, 27, 2. pp. 32-43.

Ashton, Jean. School of the Air. Melbourne. Rigby. 1971.

Becker, Ann De Vaney. 'A survey and evaluation'. Journal of Communication. Summer 1978. pp. 120-124.

Brown, Sandra M. 'Telelecture: Appalachia's in-service classroom of the air'. The Instructor. 78, 2. pp. 126

Collins, John. 'The Teletutorial Project-A Report to January, 1978.' Melbourne. Council of Adult Education. 1978.

Country Education Project. 'Memo to Principals and Subject Co-ordinators. Pilot Project Using Electronic Means of Communication. 25th March 1982.'

Educational Technology Centre-Education Department, South Australia. 'Tarcoola Project 1981. A Trial in Distance Education Methodologies Using Telecommunications.' 1981.

Hammond, Sandy. 'Tele-education at the Open University.' Journal of Communication. Summer 1978. pp. 141-148.

Imberger, Lesley. Proposal for Social Research into Teleconferencing Systems. Australian Telecommunications Commission. (Unpublished Manuscript)

Johansen, Robert. Pitfalls in the Social Evaluation of Teleconferencing Media. Institute for the Future. Menlo Park California, 1976.

Jull G. W. et al. Research Report on Teleconferencing Vol. 2. Communications Research Centre. CRC Report No. 1281-2 Ottawa, Jan. 1976.

Kruck, Donald and Tversky, Arnold D. Classroom Communication Telelecture. Audiovisual Instruction. 16.2. pp. 21-22.

Lamy Therese and Louis Villardier. Tutorship by teleconferencing in distance education. A n evaluation report at Tele-Universite. in Parker, Lorne R. Comp, Olgren, Christine H. Comp. Wisconsin Univ. Madison. Centre for Interactive Programs. 1980. ED 194 045

McIntosh, Naomi E. Evaluation of multi-media educational systems. British Journal of Educational Technology. 5, 3. p. 43-59.

Monson, Mavis, Lorne Parker and Betsy Riccomi. 'A Design for Interactive Audio.' University of Wisconsin- Extension. 1977. ED 181 892

Parker, Lorne and Marcia A. Baird. 'Teaching by telephone.' Journal of Communication. Summer 1978. pp.137-140.

Parker, Lorne A: Monson Mavis K. 'More than meets the eye. The effectiveness of broadcast audio and two-way audio instruction for distance learning.' Wisconsin University. Madison. 1980. ED 192 719

Parlett M. and Hamilton, D. 'Evaluation as Illumination: a new approach to the study of innovative programmes.' In D. Hamilton et al (ed) Beyond the Numbers Game A Reader in Educational Evaluation. Basingstoke. Macmillan, 1977.

Paton, Michael Quinn. Utilization-Based Evaluation. Sage Publications. Beverley Hills/London. 1978.

Pettit David. 'Advantages in Clustering.' T.T.A.V. News. NO. 13, 1980. pp.20-21.

Pursuoli David A. A Study of Teaching University Extension Classes by Tele-lecture. West Virginia University. Morgantown. 1970.

Seumahu, E. S. 'Satellite Communication-Uses in Education.' Perth. University of Western Australia. 1982

Telecom Directory, 1981. page 11.

Turok, Ben. 'Telephone conferencing for Teaching and Administration in the Open University.' British Journal of Educational Technology. 6, 3. pp 63-70.

Weston, J. R. and Kristen, C. 'Teleconferencing: a comparison of attitudes, uncertainty and interpersonal atmospheres in mediated and face-to-face group interactions.' Social Policy and Communications Branch. The Department of Communications. Ottawa. Canada. 1973.

White, Peter B. 'Communication Satellite Experiments in Australia: Lessons from the Education al Satellite Communication demonstration.' A paper presented at Domsat 79 Conference. Centre for Continuing Education, Australian National University. Feb.20-23. 1979.

APPENDICES

APPENDIX A

List of Participants

School	Principal	Teachers	Students
Birchip	Ray Scott	Eileen Smith Mike Smith	Debbie Lockwood Erica Kelly Yvonne Kell
Boort	John Rawlings	Mark Kelly Kaye McGrath	Lee Burke Dawn Oliver Jenny Sanau Richard Tweddle
Charlton	Peter Milward	Jenny Stankovic Graham Willis	Catherine Minister Stacey Roberts Geoff Runnals
McCauley College Charlton & Donald	Kevin Stevring	Ian Carmichael Graham Kelso	Martin Burke Cathy Byrne Marie Drum Leonie Keane Gabrielle Noonan Tricia Noonan Clare O'Shannesy Helen Young
St Arnaud	Peter Schmidt	David Kruger Daryl Leech	Jenny Burke Ann Forster Brendan Hogan Linda Johnson Paul Verbeek Christine Whalen Jodie
Wedderburn	Colin Lovejoy (acting)	Robert Bray Helen Price Kath Rawlings	Margaret Gallagher Geoff Hicks Brendan Hanrahan Anthony Jackson Linda Perryman
Wycheproof	Robert Bedggood	Greg McIntosh Anne Rowland	Wendy Botheras Tracy Clark Craig Durie Kate Harrison Cynthia McNaughton Katrina Beattie

CHARLTON PROJECT LOG BOOK

Date	Time	Name of Person(s) using equipment	Name(s) of Person(s) contacted	Length of Contact	Clarity of Speech 0 poor 3 5 7 9 good	Remarks (Subject matter, effectiveness, problems, general satisfaction)

APPENDIX C

COUNTRY EDUCATION PROJECT TELECONFERENCING EVALUATION

TEACHER QUESTIONNAIRE

Would you complete this questionnaire when you have finished each of your sessions on the teleconferencing system. Most of the questions can be answered by drawing a circle around the appropriate response. However, some of the sessions will not involve teaching and when this applies, circle the 'not applicable' number.
Space is left for more detailed comments and you should feel free to write about all aspects of this session which could influence the final evaluation of the technology.

NAME DATE
SUBJECT MATTER OF THE SESSION (e.g. Art)
LEVEL
TYPE OF INTERACTION Correspondence students to small class.
Small class to small class
Teacher(s) to teacher(s)
Teacher(s)/students to outside source
Other (give details)

Please indicate the extent of your agreement or disagreement with each of the following statements.

Strongly agree
Agree
Don't Know
Disagree
Strongly Disagree
Not Applicable

1. The students have improved their understanding of the subject matter as a result of using the teleconferencing system this session.	5 4 3 2 1 0
2. The lack of confidentiality has had no effect on my teaching.	5 4 3 2 1 0
3. I was able to ask questions and invite responses freely during the session.	5 4 3 2 1 0
4. I was willing to say things more freely using the teleconferencing system than I would in a normal face-to-face class situation.	5 4 3 2 1 0

5. This type of technology makes me feel that I am constantly being observed by those at the other end.	5 4 3 2 1 0
6. It was hard to know who was talking at the other end.	5 4 3 2 1 0
7. I was sometimes uncertain whether the people at the other end were listening.	5 4 3 2 1 0
8. I was happier using the technology this session than the previous occasion.	5 4 3 2 1 0
9. I think that if all the participants were in the same room, the discussion would have been better.	5 4 3 2 1 0
10. I found it easy to manage the responses during my session.	5 4 3 2 1 0

Using the scales provided, please indicate your overall feelings about today's discussion. Please mark each scale once.

	Extremely	Somewhat	Neutral	Somewhat	Extremely	
11. Boring	---	---	---	---	---	Interesting
12. Probing	---	---	---	---	---	Superficial
13. Relaxed	---	---	---	---	---	Tense
14. Dissatisfying	---	---	---	---	---	Satisfying
15. Dynamic	---	---	---	---	---	Static
16. Competitive	---	---	---	---	---	Co-operative
17. Useless	---	---	---	---	---	Useful
18. Varied	---	---	---	---	---	Repetitive
19. Productive	---	---	---	---	---	Counter-productive
20. Lively	---	---	---	---	---	Dragging
21. Aimless	---	---	---	---	---	Directed
22. Bad	---	---	---	---	---	Good

23. How much preparation did you do for this session relative to a normal face-to-face lesson?

more than a normal lesson.

about the same amount.

less than the normal amount.

not applicable.

24. Approximately what percentage of the students took an active part in discussions.

virtually all of them.

60 to 90 percent.

40 to 60 percent

less than 40 percent.

25. Further comments

Please identify any other issues related to this session which you feel are relevant to the evaluation of the teleconferencing system. In particular, trends related to student acceptance, the effectiveness of the technology in facilitating learning, unanticipated outcomes which may be emerging and so on.

Thanks for your help.

Ian Conboy

APPENDIX D

Student Questionnaire

Would you please complete this questionnaire when you have finished your session on the teleconference system. Most of the questions can be answered by drawing a circle around the number which indicates best your response. However, space will be left for further comments and you should feel free to write about all aspects of using the teleconferencing system in your studies.

NAME.....SCHOOL.....

FORM.....SUBJECT.....DATE.....

1. How frequent do you participate in discussion in an average face-to-face class.

Always
Very frequently
Sometimes
Occasionally
Never
5 4 3 2 1

Please indicate the extent of your agreement with each of the following statements.

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
2. I think we were confused about what we were supposed to be doing in the conference.	5	4	3	2	1
3. I felt that people talked past each other quite a bit.	5	4	3	2	1
4. I found it disturbing not being in the same room with some of the other people.	5	4	3	2	1
5. I quite often felt that my own comments were not directed to any specific person and this bothered me.	5	4	3	2	1
6. At our end, we sometimes talked things over amongst ourselves before we said anything to the others.	5	4	3	2	1
7. It was hard to know who was talking at the other end.	5	4	3	2	1
8. Getting used to this system is quite an effort.	5	4	3	2	1
9. I was sometimes uncertain whether the people at the other end were listening.	5	4	3	2	1

10. When someone at the other end

or she was speaking.	5 4 3 2 1
11. I think that if we had all been together in the same room, the discussion would have been more productive.	5 4 3 2 1
12. I had quite a bit of trouble knowing how the people at the other end were reacting to the things I said.	5 4 3 2 1
13. When those at the other end were speaking, I got the feeling they were speaking directly to me.	5 4 3 2 1
14. I think that if we had all been in one room, I would have felt more comfortable.	5 4 3 2 1
15. It was sometimes hard to react to things said at the other end because it was hard to interpret what was said.	5 4 3 2 1
16. The group discussion I was involved in today helped me understand my work.	5 4 3 2 1
17 I consider that the social contact with other teachers and students was valuable.	5 4 3 2 1
18. The system helped me gain an understanding of difficult ideas much quicker than I would have from written notes.	5 4 3 2 1

Please indicate your overall feelings about today's discussion using the scales provided. Please mark each scale once.

	Extremely	Somewhat	Neutral	Somewhat	Extremely	
19. Boring	---	---	---	---	---	Interesting
20. Probing	---	---	---	---	---	Superficial
21. Relaxed	---	---	---	---	---	Tense
22. Varied	---	---	---	---	---	Repetitive
23. Lively	---	---	---	---	---	Dragging
24. Compet -itive	---	---	---	---	---	Co-operative

Please indicate the level of effectiveness of the system by circling the

appropriate number.

Extremely effective
| Relatively effective
| | Of some value
| | | Relatively inaffective
| | | | Extremely inaffective
| | | | | Not Applicable

	5	4	3	2	1	0
25. How effective is teleconferencing relative to face-to-face teaching?	5	4	3	2	1	0
26. How effective is the teleconferencing system relative to face-to-face group student work?	5	4	3	2	1	0
27. How effective is the teleconferencing system relative to correspondence course learning from printed notes ?	5	4	3	2	1	0

28. How many times did you participate verbally during today's session?

more than
five times
3-5 times
1-3 times
none

29. Other comments.

Please identify any issues from this session which you think are important to the evaluation of the teleconferencing system.

Thank you for your help.

Ian Conboy.

APPENDIX E.

Summary of interview Questions.

Teacher Interview, Number 1.

1..Educational implications of the technology.

1.1 What are your general feelings about the system?

1.2 Do you think that the students are enhancing their knowledge using this technology?

2. The impact of the technology on your teaching.

2.1 Advising students

2.1.1 Can you emerge as a warm trusted person when you use this technology?

2.1.2 Can you encourage students to be relaxed?

2.2 Steering students.

2.2.1 Are you able to design activities for individual pupil's needs and interests?

2.2.2 Is it easy to arouse student interest when you use this technology?

2.2.3 Can the technology evoke individual participation?

2.2.4 Does the technology allow students to act independently?

2.2.6 Could presentation become monotonous?

2.2.7 Does the system encourage students to work co-operatively?

2.2.8 Are you forced to compromise on flexibility when you use this technology?

2.2.9 To what extent can you use techniques such as problem solving, role playing and trainstorming?

3.0 Socializing.

3.1 Does the technology allow you to conduct informal contacts in an open manner with pupils?

4.0 Conferring with students.

4.1 Does the technology enable you to undertake discussions with students as an equal?

5.0 Overseeing student activities.

5.1 Does the technology enable you to diagnose individual

learning difficulties?

5.2 Does the technology enable you to identify the causes of poor student progress?

5.3 Does the technology enable you to become aware of the varied causes of student behaviour?

5.4 Does the technology enable you to grade and evaluate students?

6.0 Curriculum development.

6.1 What is the effect of the technology on course organization, getting resources, daily planning and long range preparation?

7.0 Instructional fit.

7.1 What impact does the technology have on enabling you to use the right teaching strategy at the correct time?

7.2 Have you had to modify you teaching style when you have used this technology?

8.0 Preparation.

8.1 What preparation was necessary before you used the system?

9.0 Teacher involvement in verbal exchanges.

9.1 Do your students speak to each other directly or through you?

9.2 How frequently do you instigate the discussions?

9.3 How much control are you imposing on the exchanges?

9.4 Are any individuals 'hogging' the conversation?

Teacher Interview Number 2

1. Do you wish to continue using the system into Term 3?
2. Have communication patterns changed between schools in Term 2?
3. Has the technology had much impact on other staff in your school?
4. What changes would you make to the technical quality of the equipment?
5. What are the main constraints in using the system?
6. Would you recommend that other schools have access to this technology?

Student interview Number 1.

1 Do you need more individual help with your studies?

2. Does the anonymity of this technology encourage you to speak more or less?

3. Does the technology help the confident and more able student than the under-confident and less able student?

4. What impact does this technology have on:

your total knowledge,

your study techniques,

your level of confidence?

Student Interview Number 2.

1. What subjects would you have liked to study this year if you had the choice?

2. Has the technology assisted you by saving the time it has taken for you to grasp some difficult concepts?

3. Would you like to continue using this technology?

APPENDIX F

Kilmaire College,
38 Lisson Grove,
Hawthorn, 3122

Phone: 818 0528

12 July 82.

Dear Brenda,

Thanks for your note. I was happy to be able to help — but I would like to pass on a few thoughts that may help you to assess the system.

I found it a very unsatisfactory experience. The technical delays and problems were unnerving and unsettling. It was very uncomfortable not to know just what was going on. The lateness and delays in organizing the link-ups also were unfortunate, especially if a person is tied to a schedule. It was also most unsatisfactory to address a faceless, soundless audience. I just could not adjust the talk to an audience reaction, which — what I would normally try to do. I could not see if they were interested | involved | mystified | bored stiff or whatever, so it became a very impersonal and un-fulfilling task. I think it would be a far better exercise if you were to arrange for the taping of lectures, and then perhaps use the telephone system to ask questions of the speaker after playing the tape in class.

I repeat that while I was happy to be able to help you in your experiment, I hope that you

will take my reactions into account in assessing the value of the exercise.

I hope all the kids do well in their exams.

Regards,

Bob Lewis.

DEPUTY PRIME MINISTER
MINISTER FOR TRADE AND ...
PARLIAMENT HOUSE
CANBERRA 2600

31 AUG 1982

Dear Mr. McIntosh,

Thank you very much for the opportunity of taking part in the phone link with your students.

I enjoyed the opportunity of talking to them about current politics and exchanging views, and I hope they go on to look more closely at the Government of this country and its importance to all Australians.

I hope also that the program proves a successful one.

Yours sincerely,

(J. D. ANTHONY)

Mr. G. McIntosh,
8 Charles Street,
WYCHEPROOF VIC. 3527.

22/9/82

PARLIAMENT OF AUSTRALIA · **THE SENATE**

COMMONWEALTH PARLIAMENT OFFICES
400 FLINDERS STREET
MELBOURNE 3000
Telegraphic Address: 'COMMEMROOM', MELBOURNE
Telephone: 62 2521

5th July, 1982

Mr. Greg McIntosh,
HSC Politics Teacher,
Wycheproof Education Centre,
P.O. BOX 51,
WYCHEPROOF...VIC...3527

Dear Mr. McIntosh,

Thank you very much for the note which I received from you and from the five students in connection with our recent telephone conversation. I was delighted to take part in this, and I hope it will only be the first of many such activities with students in country schools.

I think it can be a great help in making contact and showing some practical contact with politicans which would often be lacking or at least there would be a lack of variety because of the difficulty of getting to distant country centres. I wish your students all the very best in their studies in the politics area, and I am only too happy to help in any way from time to time.

Yours sincerely,

Alan Missen
Senator for Victoria